I. OVERVIEW OF FEDERAL ENERGY MANAGEMENT ACTIVITIES

A. Overview of Federal Energy Management Policy and Legislative Mandates

This report on Federal Energy Management for Fiscal Year (FY) 1996 provides information on energy consumption in Federal buildings and operations and documents activities conducted by Federal agencies to meet the statutory requirements of Title V, Part 3, of the National Energy Conservation Policy Act (NECPA), as amended, 42 U.S.C. §§ 8251-8259, 8262, 8262b-k and Title VIII of NECPA, 42 U.S.C. § 8287-8287c. Implementation activities undertaken during FY 1996 by the Federal agencies under the Energy Policy Act of 1992 (EPACT), Executive Order 12759 on Federal Energy Management, and Executive Order 12902, Energy Efficiency and Water Conservation at Federal Facilities, are also described in this report. In compliance with section 381(c) of the Energy Policy and Conservation Act (EPCA), as amended, 42 U.S.C. § 6361c, this report also describes the energy conservation and management activities of the Federal Government under the authorization of section 381 of EPCA, 42 U.S.C. § 6361.

Requirements of National Energy Conservation Policy Act (NECPA) and Energy Policy Act of 1992 (EPACT)

NECPA provides major policy guidance to Federal agencies to improve energy management in their facilities and operations. Amendments to NECPA made by the Federal Energy Management Improvement Act of 1988 required each agency to achieve a 10 percent reduction in energy consumption in its Federal buildings by FY 1995, when measured against a FY 1985 baseline on a Btu-per-gross-square-foot basis. It also directed DOE to establish life-cycle costing methods and coordinate Federal conservation activities through the Interagency Energy Management Task Force. Section 152 of Subtitle F of EPACT, Federal Agency Energy Management, further amends NECPA and contains provisions regarding energy management requirements, life-cycle cost methods and procedures, budget treatment for energy conservation measures, incentives for Federal facility energy managers, reporting requirements, new technology demonstrations, and agency surveys of energy-saving potential.

Section 543 of NECPA, as amended by EPACT, 42 U.S.C. § 8253(a)(1), adds the requirement for a minimum 20 percent reduction in Btu consumption per gross square foot by FY 2000 as compared with energy consumption in FY 1985. Federal buildings include both Federally-owned and leased buildings. However, in many instances the lessor pays the energy bill, and consumption and cost data may not be available to the Government. Accordingly, Federal agencies are reporting data for leased space to the maximum extent practicable.[7] Federal agencies reported a 15.2 percent decrease in energy consumption in buildings in FY 1996, compared to FY 1985, measured on a Btu-per-gross-square-foot basis.

Section 543 of NECPA, as amended by EPACT, 42 U.S.C. § 8253(b)(1), requires that not later than January 1, 2005, each agency shall, to the maximum extent practicable, install in Federal

[7]The General Services Administration (GSA) is the primary leasing agent for the Federal Government, although most of the other agencies do have some leasing authority. In some cases, GSA will delegate operations and maintenance responsibility to individual agencies for leased space, requiring the agency to be responsible for paying the utility bills and reporting energy consumption.

buildings owned by the United States all energy and water conservation measures with payback periods of less than 10 years, as determined by using the Federal life-cycle costing methods and procedures.

In order to achieve the energy management requirements, section 543 of NECPA, as amended by EPACT, 42 U.S.C. § 8253(d), requires each agency to:

1) prepare a plan describing how the agency intends to meet the requirements;

2) perform energy surveys of its Federal buildings to the extent necessary and update such surveys as needed;

3) using such surveys, determine the cost and payback period of energy and water conservation measures likely to achieve the requirements;

4) install energy and water conservation measures that will achieve the requirements through Federal life-cycle cost methods and procedures; and

5) ensure that the operation and maintenance procedures applied under NECPA are continued.

Section 545 of NECPA, as amended, 42 U.S.C. § 8254, requires DOE to establish life-cycle cost methods to determine cost-effectiveness of proposed energy efficiency projects. DOE issued a final rulemaking on life-cycle cost methods on November 20, 1990. In October 1996, the 1996 edition of the energy price indices and discount factors for life-cycle cost analysis, developed with the technical assistance of the National Institute of Standards and Technology, was published and distributed to Federal energy managers. In February 1996, the energy price indices and discount factors were updated to reflect the latest projections from the Energy Information Administration's *Annual Energy Outlook 1996*, published in January 1996.

NECPA, as amended, 42 U.S.C. § 8255, requires the President to transmit to the Congress, along with each budget that is submitted to the Congress, the amount of appropriations requested in such budget, if any, on an individual agency basis, for electric and other energy costs to be incurred in operating and maintaining agency facilities; and compliance with the provisions of NECPA, the Energy Policy and Conservation Act (42 U.S.C. § 6201 *et seq*.) and all applicable Executive Orders. Reports from Federal agencies indicated that $179.2 million was spent in FY 1996 on energy efficiency projects in Federal facilities.

Section 546 of NECPA, as amended, 42 U.S.C. § 8256(a), also requires Federal agencies to establish a program of incentives to expedite Federal Energy Savings Performance (ESP) contracts (formerly known as shared energy savings (SES) contracts), authorized under Title VIII of NECPA. These contracts can provide Federal agencies with private sector capital to finance their retrofit projects. In turn, the private sector contractor receives a share of the savings for undertaking the investment. During FY 1996, 11 ESP contracts were awarded by Federal agencies bringing the total number of awarded contracts to 42.

Section 546 of NECPA, as amended, 42 U.S.C. § 8256(b) requires DOE to establish a Federal Energy Efficiency Fund to provide grants to agencies to assist them in meeting NECPA's energy management requirements. Section 546(c) encourages agency participation in utility incentive programs and provides for the retention of 50 percent of energy and water cost savings realized by agencies for additional energy efficiency measures. Information on these incentives is contained in Section I(E) of this report.

Section 157 of EPACT, 42 U.S.C. § 8262(c), requires Federal agencies to establish and maintain programs to train energy managers and to increase the number of trained energy managers within each agency. The Act, 42 U.S.C. § 8262(3), defines a "trained energy manager" as "a person who has demonstrated proficiency, or who has completed a course of study in the areas of fundamentals of building energy systems, building energy codes and applicable professional standards, energy accounting and analysis, life-cycle cost methodology, fuel supply and pricing, and instrumentation for energy surveys and audits." Training activities are discussed in Section D of this report.

DOE also coordinated activities to expedite energy efficiency by providing technical assistance and training and through the provision of technical and analytical models.

DOE is directed to include in this report to Congress a description of activities undertaken under section 381(a) and (b) of the Energy Policy and Conservation Act (EPCA), 42 U.S.C. § 6361. These activities are addressed in Section I(C), Federal Coordination; Section I(F), Life-Cycle Costing; and Section I(H), Public Education Programs.

Requirements of Executive Orders 12759 and 12902

During FY 1996 two Executive Orders pertaining to energy management were in effect for Federal agencies. Executive Order 12759 on Federal Energy Management, signed by President Bush in April 1991, expanded the scope of Federal energy management activities beyond the NECPA requirements to include industrial facilities and Federal vehicles. Executive Order 12902, Energy Efficiency and Water Conservation at Federal Facilities, signed by President Clinton on March 8, 1994, supersedes Executive Order 12759 but leaves in effect sections 3, 9, and 10 of that Order. The requirements of both Orders are described below.

Reduction Goals for Buildings
Executive Order 12759 established the 20 percent energy reduction goal for Federal buildings by the year 2000, from 1985 energy use levels, as long as the improvements are cost-effective and minimize the life-cycle cost of the facility. This was later incorporated into NECPA with the passage of EPACT. Executive Order 12902 establishes a 30 percent reduction goal for Federal buildings by 2005 compared to 1985 consumption levels on a Btu-per-gross-square-foot basis.

Reduction Goals for Industrial Facilities
Executive Order 12759 established for industrial facilities a goal of 20 percent improvement in energy efficiency for Federal industrial facilities from FY 1985 to FY 2000 with each agency to develop appropriate indicators of energy efficiency for measuring progress toward the goal. Executive Order 12902 changes this goal to require an increase in energy efficiency by at least 20

percent by 2005 as compared to the 1990 benchmark. Measures undertaken to achieve this goal must be cost-effective, and agencies are also directed to implement all cost-effective water conservation projects.

Implementation Strategy
Executive Order 12759 allowed the agencies flexibility in adopting an implementation strategy. If available resources at agencies fell short of requirements, the Order directed that energy efficiency projects should be prioritized by the savings-to-investment ratio or the adjusted internal rate of return. Executive Order 12902 provides a more structured approach to implementation. It requires agencies to conduct a prioritization survey of all facilities which can then be used to establish priorities for conducting comprehensive facility audits. Agencies are required to implement a 10-year plan to conduct comprehensive facility audits, so that approximately 10 percent of the agency's facilities are completed each year. Within 180 days of the completion of the comprehensive facility audit of each facility, agencies are required to begin implementing cost-effective recommendations for installation of energy efficiency, water conservation, and renewable energy technologies for that facility.

Minimization of Petroleum Use in Facilities
Section 3 of Executive Order 12759 directs agencies to minimize the use of petroleum products for facilities operations or building purposes through switching to an alternative energy source if it is estimated to minimize life-cycle costs and which will not violate Federal, State, or local clean air standards. Executive Order 12902 also contains this requirement but further directs agencies to improve the efficiency with which they use the petroleum in facilities where alternative fuels are not practical or cost-effective. Both Executive Orders require agencies to survey buildings and facilities that utilize petroleum-based fuel systems to determine where the potential for a dual-fuel capability exists and provide dual-fuel capability where cost-effective and practicable.

Procurement of Energy-Efficient Products
Executive Order 12759 directed each agency to require vendors of goods to provide data that could be used to assess the life-cycle costs of goods, including building energy system components, lighting systems, office equipment, and other energy-using equipment. Executive Order 12902 expands the scope of activities in this area by directing agencies to strive to purchase products in the top 25 percent of their class for energy efficiency, wherever such products are cost-effective and meet the agency's performance requirements. It also contains provisions for a "Federal Procurement Challenge" inviting each Federal agency to commit a specified fraction of their purchases to advanced energy-efficient and water-conserving technologies that are technically and commercially feasible but not yet available on the open market. The Government's activities to emphasize energy efficiency in procurement policy is detailed in Section I(G) of this report.

Energy Performance Standards for Buildings/Showcases
Executive Order 12759 directed agencies to implement all applicable rules and regulations in current Federal buildings space and to comply with applicable energy performance standards for the construction of new Federal buildings. Executive Order 12902 strengthens this provision to ensure that the design and construction of facilities meet or exceed the energy performance standards applicable to Federal residential or commercial buildings, local building standards, or a

Btu-per-gross-square-foot ceiling, whichever will result in a lower life-cycle cost over the life of the facility. Information on the status of Federal building energy performance standards is contained in Section II(C) of this report.

Executive Order 12902 also contains provisions for the establishment of agency facility commissioning programs and obligates agencies to designate new and existing buildings to showcase the best energy and water efficiency, and renewable energy technologies to the public. Section I(D) contains information on Federal showcase facilities designated in FY 1996.

Energy-Efficiency Goal for Vehicles

Section 10 of Executive Order 12759 establishes an energy-efficiency goal for Federal vehicles. Each agency operating at least 300 commercially designed motor vehicles domestically is directed to develop a plan to reduce gasoline and diesel consumption by at least 10 percent by FY 1995 in comparison to FY 1991. Although the goal period for this requirement is past, this report will continue to track progress against the FY 1991 base year. This progress is detailed in Section IV(B) of this report.

Alternative Fuel Vehicles

Section 11 of Executive Order 12759 establishes requirements for the acquisition of alternative fuel motor vehicles by the end of model year 1995. Agencies electing to use these vehicles receive credit toward meeting the vehicle energy efficiency goal. Information on Federal activities related to alternative fuel vehicles is included in Section IV(C) of this report.

B. Overall Federal Energy Consumption and Costs

As shown in Table 1-A, the total gross energy consumption of the Government of the United States, including energy consumed to produce, process, and transport energy, was 1.56 quadrillion British Thermal Units (quads) or 1,556,900.8 billion Btu during FY 1996. Gross energy consumption considers all resources used to generate and transport electricity and steam. (The source conversion factors of 11,600 Btu per kilowatt hour for electricity and 1,390 Btu per pound of steam are used to calculate gross energy consumption. See Appendix B for conversion factors used to calculate net energy consumption.) These 1.56 quads represent 1.7 percent of the total 89.81 quads[8] used in the United States, and reflect Government energy consumption in buildings and operations to provide essential services to its citizens, including the defense of the Nation. In total, the Federal Government is the single largest energy consumer in the Nation, although its pattern of consumption is widely dispersed.

Based on reports submitted to DOE by 30 Federal agencies, the Government consumed 1.11 quads during FY 1996 when measured in terms of energy actually delivered to the point of use (net consumption). As shown in Table 1-B, Federal agencies reported a 23.4 percent decrease in total net energy consumption compared to FY 1985, and a 1.9 percent decrease from FY 1995. The cost of this energy was $7.7 billion and represented approximately 0.5 percent of the total Federal expenditures of $1.686 trillion[9] for all purposes in FY 1996. The Federal energy bill for FY 1996 was approximately $105.7 million less than the $7.8 billion reported for FY 1995.[10]

In FY 1996, the Department of Defense spent $5.6 billion for energy of the total Federal energy expenditure of $7.7 billion. Overall, the Department of Defense used 27.7 percent less net energy in FY 1996 than in FY 1985. The Department of Energy continues to be the largest consumer of energy among civilian agencies, due to its involvement in energy-intensive nuclear research and weapons development.

Figures 1 and 2 depict the percentage of total energy used by the Federal Government in FY 1996 and its cost. As illustrated, jet fuel and electricity account for approximately 62.9 percent of the total energy consumption represented in Figure 1 and approximately 75.0 percent of the total energy costs in Figure 2.

The strategic importance of petroleum-based fuels to the Federal Government is shown in Table 2. In FY 1996, petroleum-based fuels accounted for 0.73 quads (733,141.0 billion Btu) of the total 1.11 quads consumed by the Federal Government. Of that, approximately 0.68 quads (677,665.0 billion Btu) were used by the Department of Defense primarily for jet fuel and distillate/diesel for vehicles and equipment energy. Only 0.05 quads (52,139.7 billion Btu) of petroleum-based fuels were used for Federal buildings and facilities energy.

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[8]DOE/EIA-0035(97/05), *Monthly Energy Review*, May 1997.

[9]*Analytical Perspectives, Budget of the United States Government, Fiscal Year 1998.*

[10]Appendix C indicates the annual cost of energy used in Federal buildings and facilities, vehicles and equipment, and energy intensive operations for FY 1985 through FY 1996. The combined cost per Btu for energy in each fiscal year is also shown in the table.

TABLE 1-A
TOTAL GROSS ENERGY CONSUMPTION BY FEDERAL AGENCIES
(In Billions of Btu, with Conversions to Millions of Barrels of Oil Equivalent [MBOE], and Petajoules [Joule x 10^{15}])

CIVILIAN AGENCY	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	%CHANGE 85-96	%CHANGE 95-96
USPS	50,965.1	51,457.3	53,327.2	55,794.7	57,865.1	59,097.8	60,543.2	62,372.2	66,638.9	68,794.2	71,122.5	72,974.3	43.2	2.6
DOE	97,530.8	92,983.5	93,781.8	97,008.2	90,528.1	89,471.1	86,100.8	89,434.3	86,005.9	85,216.0	87,272.7	87,241.0	-10.6	0.0
VA	42,926.5	42,135.4	42,363.5	44,838.5	45,267.5	44,337.2	45,271.6	45,394.6	46,284.4	46,639.8	47,176.6	48,722.9	13.5	3.3
GSA	42,963.0	34,082.8	32,374.8	30,431.7	31,026.2	36,590.2	36,880.8	36,282.5	37,008.9	36,468.2	35,962.8	36,827.8	-14.3	2.4
DOJ	11,026.6	11,681.6	11,485.8	13,143.3	12,081.8	11,474.0	14,162.8	12,961.0	14,835.4	16,632.6	16,988.4	20,590.3	86.7	21.2
HHS	12,978.7	10,654.3	11,227.6	12,136.6	12,880.3	16,191.3	14,353.7	15,857.0	16,264.1	16,497.0	12,010.3	12,642.0	-2.6	5.3
DOT	28,447.5	28,525.2	28,721.5	28,533.7	28,129.2	28,379.3	29,029.7	30,713.0	33,831.2	29,865.5	28,329.5	31,426.4	10.5	10.9
NASA	23,365.1	24,633.6	25,183.6	25,353.9	27,519.0	28,192.1	29,121.6	29,432.5	29,350.5	29,835.9	28,952.1	26,781.7	14.6	-7.5
DOI	11,486.5	9,955.3	9,659.7	10,464.3	10,820.5	10,864.3	10,955.6	10,643.5	11,828.6	12,156.2	10,428.9	7,525.1	-34.5	-27.8
USDA	12,152.0	10,761.5	11,493.8	12,005.7	12,950.3	14,397.6	14,590.7	14,039.6	14,426.5	14,494.1	14,851.9	14,099.9	16.0	-5.1
DOL	3,920.0	3,988.4	4,035.1	4,185.3	4,119.4	4,103.2	4,186.7	4,209.9	4,324.2	4,403.2	4,279.0	4,381.1	11.8	2.4
TRSY	3,606.0	3,479.0	5,681.8	9,613.4	8,370.1	6,477.3	7,960.4	8,699.7	8,561.0	8,419.7	7,677.7	7,139.0	98.0	-7.0
TVA	1,899.5	1,966.8	2,045.0	1,980.6	1,784.5	1,887.1	1,958.1	1,830.8	1,917.5	7,436.2	7,484.9	7,172.5	277.6	-4.2
EPA	1,750.5	1,572.7	1,498.4	1,603.1	1,588.0	1,616.4	1,782.6	1,811.6	1,998.8	2,082.1	2,231.2	2,172.7	24.1	-2.6
DOC	4,038.8	3,631.2	3,493.9	3,912.4	4,597.0	6,327.7	4,536.0	4,372.8	4,636.9	5,392.2	5,585.1	5,297.0	31.2	-5.2
ST	704.0	740.5	832.8	818.4	835.1	852.2	845.4	829.4	1,177.8	1,263.2	1,316.1	1,867.7	165.3	41.9
FEMA	190.5	295.6	312.1	351.8	395.3	459.6	442.7	453.6	421.5	410.3	410.3	410.3	115.3	0.0
HUD	349.3	350.1	355.7	373.0	417.0	426.5	446.0	418.0	381.9	354.8	342.1	358.4	2.6	4.8
OPM	168.1	174.6	175.1	200.6	214.0	218.2	227.1	239.2	312.3	312.3	312.3	312.3	85.8	0.0
PCC	1,189.4	1,300.1	1,409.8	1,372.2	1,434.0	1,399.5	1,358.9	1,461.0	1,467.0	1,479.4	1,687.2	1,683.2	41.5	-0.2
FCC	42.0	41.6	46.2	44.5	41.0	50.1	50.9	41.3	42.3	46.0	46.0	36.4	-13.2	-20.8
OTHER*	628.1	838.7	981.3	1,039.8	4,154.5	3,390.4	2,409.5	2,443.1	2,755.4	3,695.8	6,060.2	8,622.9	1,272.9	42.3
CIVILIAN AGENCIES TOTAL														
BBTU	352,327.9	335,249.8	340,486.5	355,205.6	357,018.0	366,202.9	367,214.7	373,940.7	384,470.9	391,894.7	390,528.1	398,284.9	13.0	2.0
DOD	1,494,704.2	1,460,487.5	1,537,276.3	1,424,872.8	1,564,051.2	1,536,176.1	1,554,075.0	1,388,726.4	1,330,916.1	1,253,516.9	1,189,980.4	1,158,615.9	-22.5	-2.6
ALL AGENCIES TOTAL														
BBTU	1,847,032.2	1,795,737.3	1,877,762.8	1,780,078.3	1,921,069.1	1,902,379.0	1,921,289.7	1,762,667.0	1,715,387.1	1,645,411.7	1,580,508.4	1,556,900.8	-15.7	-1.5
MBOE	317.1	308.3	322.4	305.6	329.8	326.6	329.8	302.6	294.5	282.5	271.3	267.3		
Petajoules	1,948.6	1,894.4	1,981.0	1,877.9	2,026.7	2,006.9	2,026.9	1,859.5	1,809.7	1,735.8	1,667.4	1,642.5		

DATA AS OF 12/05/97

*Other includes, for certain years, CFTC, CIA, EEOC, FTC, NARA, NSF, NRC, RRB, SSA, USIA, and FERC.

[1]TVA's increase in energy consumption beginning in FY 1994 is the result of first-time reporting of energy consumed at generation sites.

Note: FY 1996 contains estimated data for the following agencies: FEMA, FTC, and OPM. This table uses a conversion factor for electricity of 11,600 Btu per kilowatt hour and 1,390 Btu per pound of steam. Agencies are listed in descending order of consumption for the current year. Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

TABLE 1-B
TOTAL NET ENERGY CONSUMPTION BY FEDERAL AGENCIES
(In Billions of Btu, with Conversions to Millions of Barrels of Oil Equivalent [MBOE], and Petajoules [Joule x 10^{15}])

CIVILIAN AGENCY	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	%CHANGE 85-96	%CHANGE 95-96
DOE	52,271.5	50,406.1	48,579.1	49,911.9	44,251.7	43,467.5	42,178.6	44,300.2	43,688.5	42,279.2	47,089.7	44,424.9	-15.0	-5.7
USPS	27,762.5	28,036.6	28,474.7	29,618.2	30,306.7	30,616.2	30,817.0	31,674.2	33,725.1	34,950.8	36,220.9	36,427.1	31.2	0.6
VA	25,144.7	25,020.9	24,877.5	26,255.1	26,249.3	24,898.4	25,050.4	25,254.9	25,741.2	25,587.8	25,428.9	26,832.9	6.7	5.5
DOT	19,342.4	19,394.0	19,001.8	18,715.6	18,507.2	18,965.2	18,971.4	17,027.3	19,360.1	19,772.6	18,400.0	19,353.2	0.1	5.2
GSA	17,330.7	14,003.0	13,081.8	12,385.4	12,659.9	14,226.0	13,985.0	13,842.0	14,149.4	13,963.0	13,671.8	14,499.2	-16.3	6.1
DOJ	8,176.0	8,592.7	8,123.5	9,439.0	7,749.4	6,961.6	8,018.3	7,544.3	9,081.7	10,263.6	10,193.3	12,127.7	48.3	19.0
NASA	10,827.9	11,156.8	11,098.7	11,213.8	12,102.7	12,321.4	12,435.4	12,527.7	12,373.2	12,564.7	12,375.2	11,468.8	5.9	-7.3
USDA	8,358.7	6,797.9	7,309.5	7,784.1	8,667.1	9,519.6	9,599.6	9,100.6	9,332.9	9,412.9	9,728.8	9,056.9	8.4	-6.9
HHS	6,983.4	6,219.9	6,559.3	6,386.5	6,729.3	7,957.0	7,107.1	7,954.7	8,146.3	8,408.3	6,129.7	6,628.9	-5.1	8.1
DOI	7,816.3	6,857.9	6,631.9	6,976.3	7,148.8	7,391.9	7,094.8	6,992.4	7,482.1	7,892.2	6,378.4	4,326.6	-44.6	-32.2
TRSY	2,770.0	2,702.1	3,679.3	7,118.7	5,242.4	3,391.6	4,177.1	4,628.4	4,912.7	4,558.2	4,132.6	3,764.1	35.9	-8.9
DOC	2,489.1	2,274.6	2,144.5	2,522.9	2,859.2	4,476.3	2,722.2	2,460.1	2,338.4	2,858.3	2,882.8	2,883.1	15.8	0.0
TVA	980.9	902.6	960.6	932.9	818.0	904.5	961.3	834.4	892.1	2,534.9	2,607.3	2,547.8	159.7	-2.3
DOL	2,385.2	2,416.0	2,403.3	2,501.1	2,430.1	2,376.0	2,446.0	2,452.4	2,514.9	2,527.9	2,385.7	2,491.5	4.5	4.4
EPA	904.5	783.1	765.4	801.4	776.8	747.0	822.4	839.7	994.8	1,041.2	1,120.6	1,099.7	21.6	-1.9
PCC	724.2	805.9	899.0	847.9	916.1	873.1	808.1	923.5	914.9	921.0	1,108.0	1,080.8	49.2	-2.5
ST	246.9	264.7	305.0	301.2	302.9	302.6	274.2	273.8	390.2	422.3	437.3	653.3	164.6	49.4
FEMA	96.1	151.9	157.9	171.5	192.5	215.1	198.4	204.1	188.3	172.9	172.9	172.9	80.0	0.0
OPM	54.3	54.5	54.5	67.3	72.1	70.8	74.6	91.4	161.5	161.5	161.5	161.5	197.3	0.0
HUD	116.9	117.4	119.4	123.8	139.1	140.3	162.3	156.9	149.0	144.5	131.7	140.8	20.4	6.9
FCC	23.6	21.4	24.3	22.4	20.6	23.9	22.1	19.9	20.2	20.7	20.7	17.5	-25.8	-15.5
OTHER*	257.8	342.6	405.0	433.7	1,859.4	1,889.1	1,109.0	1,165.0	1,254.3	1,646.6	2,645.2	3,381.8	1,211.8	27.8
CIVILIAN AGENCIES TOTAL														
BBTU	195,063.8	187,322.4	185,655.9	194,530.6	190,001.1	191,735.1	189,035.1	190,267.7	197,811.8	202,105.1	203,423.2	203,541.2	4.3	0.1
DOD	1,250,613.8	1,222,801.5	1,280,539.2	1,165,755.3	1,274,443.6	1,241,655.8	1,269,291.5	1,103,990.1	1,048,772.9	977,040.4	926,022.9	904,150.2	-27.7	-2.4
ALL AGENCIES TOTAL														
BBTU	1,445,677.6	1,410,123.9	1,466,195.2	1,360,285.9	1,464,444.7	1,433,390.9	1,458,326.6	1,294,257.9	1,246,584.7	1,179,145.5	1,129,446.1	1,107,691.4	-23.4	-1.9
MBOE	248.2	242.1	251.7	233.5	251.4	246.1	250.4	222.2	214.0	202.4	193.9	190.2		
Petajoules	1,525.1	1,487.6	1,546.8	1,435.1	1,544.9	1,512.2	1,538.5	1,365.4	1,315.1	1,244.0	1,191.5	1,168.6		

DATA AS OF 12/05/97

*Other includes, for certain years, CFTC, CIA, EEOC, FTC, NARA, NSF, NRC, RRB, SSA, USIA, and FERC.

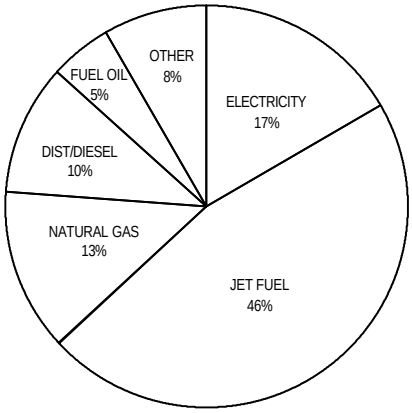
[1]TVA's increase in energy consumption beginning in FY 1994 is the result of first-time reporting of energy consumed at generation sites.

Note: FY 1996 contains estimated data for the following agencies: FEMA, FTC, and OPM. This table uses a conversion factor for electricity of 3,412 Btu per kilowatt hour. Agencies are listed in descending order of consumption for the current year. Sum of components may not equal total due to independent rounding.

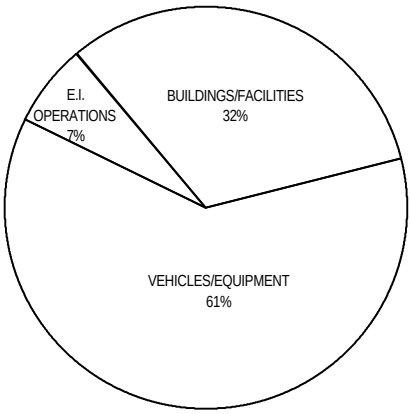
Source: Federal Agency Annual Energy Management Data Reports

FIGURE 1
Federal Energy Consumption, FY 1996

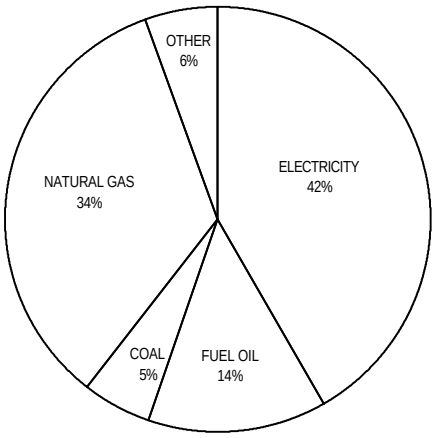
Total by Energy Type: 1.11 quads



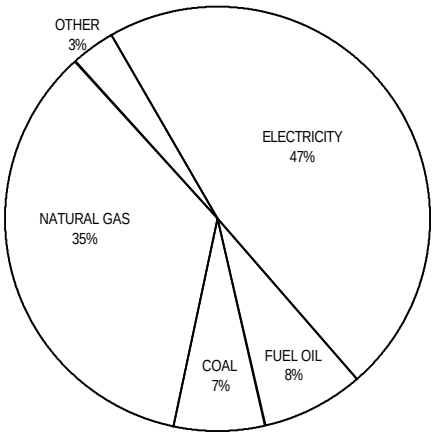
Total by Sector: 1.11 quads



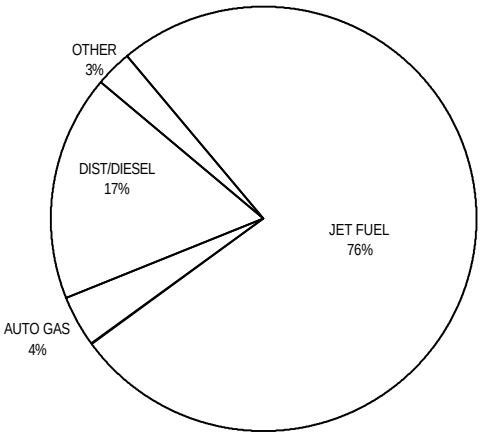
Buildings & Facilities: 0.36 quads



Energy Intensive Operations: 0.07 quads



Vehicles & Equipment: 0.68 quads

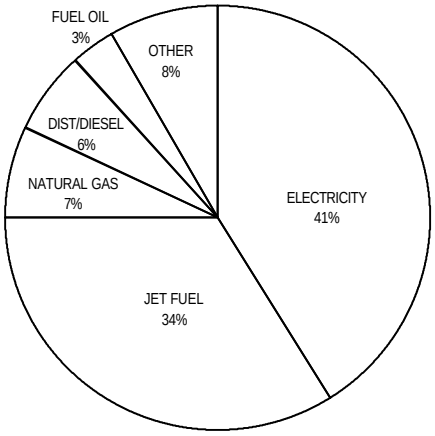


Data as of 12/05/97

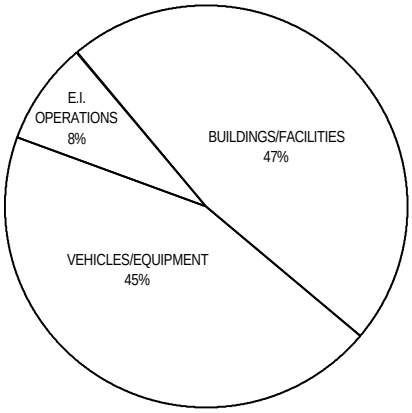
Source: Federal Agency Annual Energy Management Data Reports
Note: Sum of components may not equal 100 percent due to independent rounding.

FIGURE 2
Federal Energy Costs, FY 1996

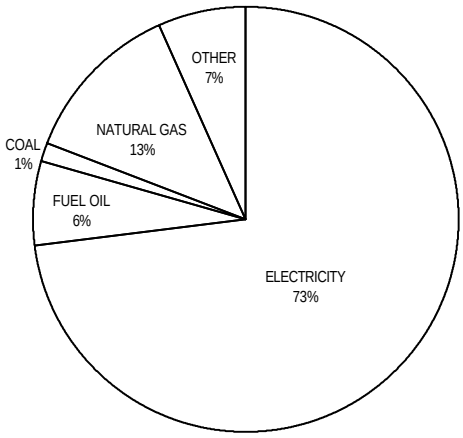
Total by Energy Type: $7.70 Billion



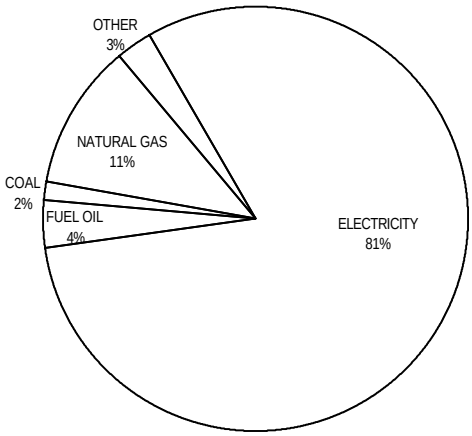
Total by Sector: $7.70 Billion



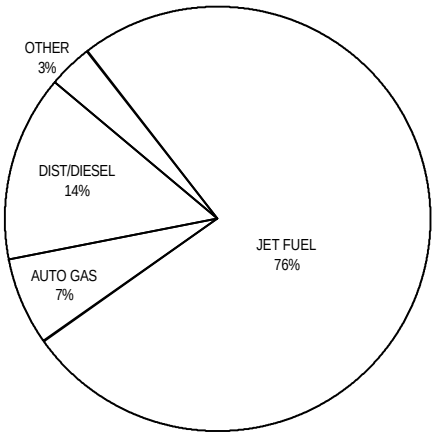
Buildings & Facilities: $3.63 Billion



Energy Intensive Operations: $0.64 Billion



Vehicles & Equipment: $3.43 Billion



Data as of 12/05/97

Source: Federal Agency Annual Energy Management Data Reports
Note: Sum of components may not equal 100 percent due to independent rounding.

TABLE 2
FEDERAL PETROLEUM USAGE IN FY 1996
(in Thousands of Gallons, Billions of Btu,
and Petajoules [Joule x 10^{15}])

	Unit Total (KGal)	BBTU* DOD	BBTU* Civilian	BBTU* Total	Petajoules* Total
Buildings & Facilities					
Fuel Oil	355,764.9	41,020.4	8,324.2	49,344.6	52.06
LPG/Propane	29,268.5	1,841.3	953.8	2,795.1	2.95
Excluded Buildings					
Fuel Oil	40,928.5	3,560.7	2,116.1	5,676.8	5.99
LPG/Propane	2,457.9	40.6	194.1	234.7	0.25
Vehicles & Equipment					
Motor Gas	220,503.0	3,323.3	24,239.6	27,562.9	29.08
Dist-Diesel & Petrol.	833,592.1	111,311.7	4,307.5	115,619.2	122.00
Aviation Gas	1,931.2	3.3	238.1	241.4	0.25
Jet Fuel	3,945,916.4	504,842.5	8,126.6	512,969.1	541.16
Navy Special	0.0	0.0	0.0	0.0	0.00
LPG/Propane	231.2	0.0	22.1	22.1	0.02
Other	18,697.1	11,721.2	6,975.9	18,697.1	19.72
Total		677,665.0	55,476.0	733,141.0	773.40

DATA AS OF 12/05/97

*Uses a conversion factor of:

95,500 Btu/gallon for LPG/propane
138,700 Btu/gallon for fuel oil, distillate-diesel & petroleum, and navy special
125,000 Btu/gallon for motor gasoline and aviation gasoline
130,000 Btu/gallon for jet fuel
947.9 Billion Btu/Petajoule

Note: FY 1996 contains estimated data for the following agencies: FEMA, FTC, and OPM.
Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

C. Federal Coordination

Federal Interagency Energy Policy Committee ("656" Committee)

A number of Federal coordination activities were carried out in FY 1996. A meeting of the Federal Interagency Energy Policy Committee ("656" Committee) took place on June 26, 1996. The meeting was convened by Christine A. Ervin, Assistant Secretary for Energy Efficiency and Renewable Energy and Chair of the "656" Committee. The highlight of the meeting was the recognition of the 1996 Federal Energy Saver Showcase facilities and the awarding of plaques. Executive Order 12902 calls for each Federal agency to designate at least one facility as a showcase. Mark Ginsberg, Chairman of the Federal Interagency Energy Management Task Force and Director of the Federal Energy Management Program, noted that lack of information, education, and understanding have been the key barriers to energy management success, and the showcasing of these facilities provides an opportunity to demonstrate successes.

Other meeting topics included: site versus source measurement of energy consumption, Federal Green Lights Program partnership, restructuring of the "656" Committee, budget issues, a Water Working Group update, Procurement Challenge Update, and the Renewable Working Group Implementation Plan.

Federal Interagency Energy Management Task Force

The Interagency Energy Management Task Force was established by section 547 of NECPA, as amended, 42 U.S.C. § 8257. The Task Force met six times during FY 1996. Meetings were held on October 10, 1995, December 19, 1995, February 1, 1996, March 20, 1996, May 29, 1996, and July 18, 1996.

The October meeting focused on activities relating to Federal energy management and on several items affecting energy and water efficiency programs as well as renewable energy programs. Reports were presented by the Water Working Group, the Audit Working Group, and the Renewable Energy Working Group and regarding the Energy Efficiency and Resource Conservation Challenge and the Federal buildings component (Federal Buildings Supplemental Survey) of the Energy Information Administration's Commercial Buildings Energy Consumption Survey. Barriers to implementation of energy savings performance contracting and utility contracts were discussed and a report on the Federal Energy Efficiency Fund was given.

The Task Force's December meeting featured a report from the Leased Space Working Group and reports on the status of the Renewable Implementation Plan and establishment of building commissioning programs. A New Technologies Demonstration Program update was presented. The Task Force was asked for their comments and ideas on improving the Federal Energy and Water Management Awards Program. Other issues discussed included utility programs, natural gas issues and concerns of the American Gas Association about Federal energy management policies, recent updates to building energy analysis software (Version 5 of A Simplified Energy Analysis Method (ASEAM)), and a report on establishing Federal Partner Resource Centers at utilities.

The Task Force met on February 1, 1996 and continued discussions and featured status reports on the issues identified above. Additionally, an update of the energy efficient product procurement program was presented, as well as a briefing on the Federal measurement and verification protocols. The Audit Working Group also reported on that group's activities, as did the Water Conservation Working Group. Changes to the nomination criteria for the Federal Energy and Water Management Awards were outlined and copies distributed to the Task Force.

The fourth Task Force meeting of FY 1996 was on March 20, 1996. The activities of the Water Conservation Working Group were summarized, including their initiatives to incorporate water conservation into energy savings performance contracts. The Audit Working Group announced that in the future the SAVEnergy program would be coordinated by DOE Regional Support Office staff. The Renewables Working Group reported on the Renewables Implementation Plan and announced that the first ESPC for a Federal renewable energy project was signed. The establishment of a solar enterprise zone by a nonprofit organization in Nevada was discussed. An update on the Product Procurement Program was also given. The date for TeleFEMP III, *Saving Billions from Federal Energy Management*, was announced (May 15, 1996).

The Task Force had been asked to study the implications of Section 625 of Public Law 104-52, the Treasury, Postal Service, and General Government Appropriations Act of 1996 and identify issues of concern. The Task Force reviewed the responses from seventeen of the eighteen agencies queried and some of the general issues raised.

The fifth Task Force meeting of FY 1996 was on May 29, 1996. The Water Conservation Working Group plan to develop a draft *Federal Register* notice to incorporate water conservation into energy savings performance contracts was announced. It was reported that work was progressing on developing baselining methods for measuring water consumption. It as also reported that the Monterey (CA) Water Conservation District was experiencing a severe shortage and had an immediate need to implement water conservation measures at agency facilities in that region. The Task Force members were asked to notify FEMP of any of their facilities in the Monterey area.

An overview of Agency reporting of vehicle fuel consumption, including reporting on gasoline and diesel fuel consumption in Federal vehicles, was given. With the expiration of the Federal Property Management Regulations, a decision was needed on continued reporting of the fuels. The Task Force agreed that continued reporting has value, particularly if a new requirement is instituted in the future. The Task Force agreed to continue the status quo reporting methods for one more year, and consider a new reporting mechanism for FY 1997.

Additional items considered were nomination for the Federal Energy and Water Management Awards, the status of procurement activities, such as: development of a Basic Ordering Agreement for energy-efficient, non-CFC chillers; incorporation of the "$^{E}_{E}$" symbol in the GSA home appliance catalog; outreach activities; electronic commerce integration; and completion of product recommendations. The Task Force was updated on the progress of the New Technology Demonstration Program and its publications available on FEMP's Internet web site.

The Task Force was briefed on several other topics, including the draft Request for Proposals for the "Super Energy Saver Performance Contract," the proposed memorandum of understanding

between DOE, EPA, and agencies that will allow agency participation in EPA's Green Lights program, and a similar MOU for agency participation in the Energy Star Buildings Program. The Renewable Energy Working Group announced that The Implementation Plan had been approved and signed by Departments of Agriculture, Commerce, Defense, Energy, Health & Human Services, Interior, State, Transportation, Treasury, and Veterans Affairs, as well as the General Services Administration and the National Aeronautics and Space Administration.

The sixth Task Force meeting of FY 1996, held on July 18, 1996, was a short information session. Mr. Bradley J. Davids of ESource, Inc. outlined ESource's product line.

The complete minutes of these meetings are available from the DOE Federal Energy Management Program office.

D. Personnel and Energy Awareness Activities

Training

During FY 1996, DOE's Federal Energy Management Program (FEMP) conducted 55 training workshops and symposia for more than 1,700 attendees in the efficient use and conservation of energy, water, and renewable energy in Federal facilities.

Nine workshops on energy savings performance contracting (ESPC) were conducted in FY 1996 for 232 participants. In each workshop, facility managers, contract specialists, and building engineers were instructed on the statutory provisions for this innovative contracting/financial method, and how to identify suitable projects. ESPC allows energy-efficient improvements to be installed by private contractors with no up-front capital costs. Among the agencies that have participated in the courses and produced project solicitations are the National Park Service in Ellis Island, New York (Department of the Interior), the Forbes Field National Guard in Topeka, Kansas (Department of Defense), and the Department of Veterans Affairs Medical Center in Washington, D.C. Each of these facilities has issued a *Commerce Business Daily* notice for the purpose of installing energy conservation measures.

The Federal Energy Management course provided guidance on meeting the qualifications of "trained energy manager" as defined by EPACT. Two workshops were conducted for 87 participants nationwide. In addition, the Water Resource Management course presented instruction to help Federal facility managers improve the efficiency of water use, consistent with legal and environmental requirements. Three workshops were conducted for 99 participants at sites across the country.

The Designing Low Energy Buildings (Non-Residential) course was presented three times for 51 participants, in conjunction with major industry conferences. The two-day course included analyses and case studies of building design using passive solar heating, natural ventilation and cooling, and daylighting, as well as glazing and overhangs.

The Federal Relighting Initiative (FRI) course was conducted three times for a total of 62 participants. The objective was to provide guidance on energy-efficient lighting consistent with other facility lighting considerations, quality and cost, and whole building analysis. Topics

included: basic lighting concepts; a comprehensive process for Federal relighting project development and implementation; application of the Federal Lighting Expert (FLEX) System and other analytical software tools; and the use of professional lighting design services.

Four Facility Energy Decision Screening (FEDS) workshops were held during FY 1996 for 87 attendees. This is a training course for Federal facility managers on whole-site analysis of energy conservation technical and financial opportunities utilizing the FEDS-Level 1 project screening software and the FEDS-Level 2 project implementation software.

FEMP, in conjunction with the National Institute of Standards and Technology, conducted three workshops on life-cycle costing (LCC) and building retrofit simulation for 79 students. An additional two sessions of the LCC workshop were provided for 30 students by FEMP-trained "DOE-qualified instructors." Three "A Simplified Energy Analysis Method (ASEAM)" workshops for 47 students focused on the use of the building retrofit analytical software.

The Implementing Renewable Energy Projects course was presented twice for 85 students. The Operations and Maintenance Management course was held three times for 50 individuals.

FEMP continued to offer its Water Resource Management course with three workshops for 99 attendees in FY 1996. The course is designed to assist Federal site managers and agencies in meeting the water conservation requirements of EPACT and Executive Order 12902.

During FY 1996, FEMP participated in the organization and presentation of 21 panel discussions on Federal energy efficiency, water conservation, and renewable energy topics at national energy management conferences around the country attracting 868 attendees.

The Federal Energy Management Program continued to offer its Training Course Locator System to assist Federal agencies in training energy managers and in meeting the requirements of the EPACT. The Locator System connects those seeking particular training courses with the sponsoring organization for those courses by responding to numerous requests from Federal energy managers, utility managers, engineers, building operators, and facility personnel.

EPACT requires the General Services Administration (GSA) to hold five workshops per year to promote coordinated energy management strategies with Federal, State, local, tribal, and county public officials. In 1996, GSA held 13 workshops in partnership with Federal agencies and State governments. These workshops included 10 workshops with the State of South Carolina on the ASHRAE 90.1 standard, a partnership workshop with Consolidated Edison and DOE in New York, a financing workshop cosponsored with DOE in Seattle, Washington, and the Energy and Environmental Management Conference (TEEM '96) held in Monterey, California.

Recognition

Outstanding accomplishments in energy efficiency and water conservation in the Federal Sector were recognized with the presentation of the Federal Energy and Water Management Awards on November 14, 1996 at the National Press Club in Washington, D.C. The Awards Program is sponsored by the "656" Committee and the Department of Energy. Awards were selected from outstanding Federal energy managers and contributors who:

- Improved energy performance, through increased energy efficiency, use of renewables and water conservation;
- Implemented proven energy efficiency, energy and water conservation techniques;
- Developed and implemented energy-related training programs;
- Developed and implemented employee energy awareness programs;
- Succeeded in receiving utility incentives, or awarding ESPC and other Federal-approved performance-based energy and water contracts;
- Made successful efforts to fulfill compliance with energy and water reduction mandates;
- Improved energy efficiency or reduction in energy costs for Federal mobile equipment including aircrafts, ships, and vehicles;
- Improved tracking of energy consumption, costs and energy efficient investments;
- Provided leadership in purchasing or supplying energy-efficient, renewable energy or water-conserving products to one or more Federal agencies; and
- Demonstrated cost-beneficial landscape practices which utilize techniques that seek to minimize the adverse effects of landscaping.

Recipients of the 1996 awards were selected from 177 nominees submitted by 19 Federal agencies. Award recipients totaled 56, representing 13 different Federal agencies. Distribution of awards among the Federal agencies for accomplishments in FY 1995 is indicated below. Awards were presented to agencies in the categories shown in the chart below.

Agency	Mobility Energy	Individual Energy	Organization Energy	Small Group Energy	ESPC	Water Conservation	Beneficial Landscaping
DOT				1			
USAF		2	2	1		1	
Army		2	4	3		3	1
Navy	1	1	4	1			
DOE		1		2			
Interior		1				1	
GSA		2	3	3		1	
NASA	1	1		1			
TVA			1				
USMC		1		1			
USPS		2		1	2		
VA				1	1		
HHS		1				1	
TOTAL	**2**	**14**	**14**	**15**	**3**	**7**	**1**

Energy Awareness

The Federal Government, as the largest single employer in the United States, has the responsibility to set an example for the nation by conducting energy awareness programs. Most agencies have ridesharing, carpooling, and/or public transportation programs in effect. Many agencies also participate in recycling programs. Examples of employee awareness activities at the agencies follow.

The Department of Agriculture has included initiatives in its implementation strategy to institute and/or emphasize energy conservation awareness with facility managers and building occupants and to provide incentive awards to facility managers and others who contribute to the energy efficiency of the Department.

The Social Security Administration Headquarters Complex has an employee energy efficiency campaign underway which includes articles in a monthly bulletin to explain its energy conservation strategies and examples of how employees can participate.

The Department of Housing and Urban Development encourages employees to participate in its rideshare assistance program through promotional flyers and displays. The Department has also implemented a nationwide transit subsidy program to encourage the use of mass transportation.

At the Department of the Interior, Departmental Energy Conservation Committee meetings allowed for dissemination of information and emphasis on increased management awareness of the energy management program. Interior Bureaus were reintroduced to computer programs, training courses, and other energy management materials. Through an ongoing energy-notice program building occupants received written notification through random surveys and scheduled inspections when energy-consuming equipment such as lights, radios, and fans have not been turned off. The Department of the Interior also has a computerized rideshare program and Bureaus in some areas have provided free parking incentives for car-pooling and ridesharing.

The Department of Labor's Fuel Efficiency Outreach Program includes ridesharing activities and employee awareness programs sponsored by the General Services Administration, local governments, and transit authorities.

The Department of State has an active agency-wide employee education program which promotes conservation of energy in buildings, facilities, vehicles and equipment as the responsibility of each and every employee.

The Department of Transportation distributes information on new procedures, products, and contracting methods that will facilitate more efficient operation of facilities through its Departmental Energy and Water Management Committee. The Department also has an ongoing ridesharing program and an active transit benefit program.

Employee awareness plays an integral part of the Treasury Department's energy management program. The Department and individual Bureaus seek to make employees aware of the positive aspects of energy conservation by educating employees about ridesharing and energy conservation.

The Environmental Protection Agency's energy and water conservation program includes the Conservation Information Clearinghouse and Hotline, a newsletter, an Awareness Materials Package for energy managers, a summary document on energy efficient and water conserving technologies for facility managers, and program and technology briefings.

The General Services Administration (GSA) included employee and tenant conservation awareness as one point in its Seven Point Energy and Water Reduction Plan issued in 1993. GSA is the lead agency in the Federal Ridesharing Program, has implemented the Federal Employees Clean Air Incentives Act which authorizes agencies to provide transit subsidies to Federal employees, and has established telecommuting centers at sites across the country.

The National Aeronautics and Space Administration (NASA) installed a display in the lobby of its Energy Showcase Facility at Marshall Space Flight Center to increase the awareness of building occupants and visitors of the building's existing and planned energy and water conservation features.

The Nuclear Regulatory Commission (NRC) has an ongoing employee awareness program at its One and Two White Flint North Buildings which provides information to employees regarding their responsibilities and contributions in achieving energy reduction goals. NRC participates in a ridesharing network; offers public transportation subsidies to all employees; uses non-monetary incentives such as flextime, compressed work schedules and priority parking assignments for car and van pools; and provides facilities for bicyclists. NRC also promotes reduction in fuel consumption through transportation fairs, employee announcements, and newsletters.

The Panama Canal Commission (PCC) furnishes agency-wide directives and prints articles in English and Spanish in its official bimonthly publication (*The Spillway*) as a means of disseminating energy-related concerns to its employees. Canal area U.S. Military components also publish a weekly newspaper and operate an English language TV station accessible to PCC, which actively carries relevant energy saving and conservation objectives, tips and other energy use issues. The PCC Incentive Awards Suggestion Program further stimulates employee energy conservation awareness and participation.

Employee awareness and recognition programs at the United States Postal Service included mailing of the DOE "Energy Awareness" poster to all 37,000 postal facilities and publication of notices for a "Turn Off the Lights Campaign." The Postal Service continues its ridesharing program which includes transit subsidies, preferential parking, a newsletter, educational activities, flexible work hours, and recognition awards. The Postal Service began an initiative in FY 1994 to educate purchasing personnel on issues such as energy conservation and sources of supply for energy efficient products. In addition to briefings and training, a quarterly newsletter was published for purchasing personnel covering energy and environmental issues.

The Department of Energy, the Office of Personnel Management, and the Railroad Retirement Board also have employee energy awareness programs which disseminate energy efficiency information throughout their agencies. DOE's program includes transit subsidies, flexible work hours, and recognition awards.

Federal Energy Saver Showcase Facilities

Section 307 of Executive Order 12902 requires that each agency which constructs at least five buildings in a year, shall designate at least one building, at the earliest stage of development, to be a showcase highlighting advanced technologies and practices for energy efficiency, water conservation, or use of solar and other renewable energy. Furthermore, it requires that the agencies attempt to incorporate cogeneration, solar and other renewable energy technologies, and indoor air quality improvements. Selection of such buildings are based on considerations such as the level of non-Federal visitors, historical significance, and the likelihood that visitors will learn from the demonstration and initiate similar projects. The Order charges each agency to develop and implement plans in cooperation with DOE and, where appropriate, in consultation with the General Services Administration, the Environmental Protection Agency, and other appropriate agencies, to determine the most effective and cost effective strategies to implement these demonstrations.

The showcase facilities designated in FY 1996 feature a wide variety of approaches and technologies at widely disparate Federal sites. Several agencies have chosen to designate their Washington, DC headquarters facilities, as well as sites more unique to their particular agency throughout the United States. Other agencies have selected energy efficient and renewable projects at sites in a number of regions across the country. Nearly 90 percent of the projects involve lighting upgrades and seventy percent will include the installation of more efficient heating, ventilation and cooling (HVAC) systems. These showcases include relatively uncomplicated, high energy-saving lighting retrofits, incorporating the use of occupancy sensors and daylighting strategies.

A number of projects will replace existing chillers with high efficiency, nonchlorofluorocarbon-using chillers. With the chiller retrofit, agencies can rid their facilities of ozone-depleting refrigerants, downsize their cooling equipment and even leverage incentives from their utility partners. Several projects incorporate the best energy efficiency measures and landscape planning, whenever cost effective. Approximately half of the showcase facilities are considering the use of solar and other renewable energy sources, with nearly one-third utilizing solar water heating technology. Water conservation is planned for an additional 50 percent of the facility showcases. The demonstrations represent a partnership between Federal agencies, utilities, and four manufacturers.

The success of these projects reveal the strength of partnering with utilities, national laboratories, energy services companies, other agencies, and FEMP programs such as the SAVEnergy Action Plan audit program. Design assistance, low or no cost energy audits, incentives and funding are available to make these projects a reality. Energy partners have a mutually beneficial goal of operating Federal facilities at their peak efficiency.

A comprehensive list of Federal showcase facilities designated in FY 1996 follows.

FY 1996 Federal Energy Saver Showcase Facilities

Agriculture	Jamie L. Whitten Federal Building, Washington, DC
	Headquarters Complex South, Washington, DC
Commerce	Herbert C. Hoover Federal Building (HQ), Washington, DC
Defense	The Pentagon, Washington, DC
Army	Aberdeen Proving Ground, Aberdeen, MD
	Fort Irwin, Sacramento, CA
	Army Reserve Training Center and Maintenance Shop, Toledo, OH
	Photovoltaic Power Station, Yuma Proving Ground, Yuma, AZ
	Army Chaplain Center and School, Fort Jackson, SC
	Defense Information School, Fort Meade, MD
	U.S. Army Intelligence Center, Fort Huachuca, AZ
Navy	Naval Construction Battalion Center, Port Hueneme, CA
	United States Naval Academy, Annapolis, MD
Education	FB6 Headquarters Building, Washington, DC
Energy	Nevada Solar Enterprise Zone, Nevada Test Site, Southern NV
	Environmental Molecular Sciences Laboratory, Richland, WA
	Nevada Support Facility, North Las Vegas, NV
	Atlas Facility, C-1 Building, North Las Vegas, NV
	Nevada Test Site, Building 300, Cafeteria, Mercury, NV
	Nevada Test Site, Building 1000, Badging Office, Mercury, NV
	Feynman Computing Center, Fermilab-Batavia Area Office, Batavia, IL
	Oak Ridge Centers for Manufacturing Technology, Oak Ridge, TN
	Energy Division Office Building, Oak Ridge National Laboratories, Oak Ridge, TN
	Naval Petroleum Reserves Cogeneration Plant, Tupman, CA
	HAMMER Training Center, Richland, WA
EPA	Headquarters-Waterside Mall, Washington, DC
	National Vehicle and Fuel Emissions Laboratory, Ann Arbor, MI
	Region III Laboratory, Fort Meade, MD
GSA	Denver Federal Center-Building 67, Denver, CO
	United States Federal Courthouse-Foley Square, New York, NY
	New Reno Courthouse, Reno, NV
HHS	Hubert H. Humphrey Headquarters, Washington, DC
	White River Health Center, White River, AZ
HUD	Headquarters Building, Washington, DC
Interior	Bureau of Reclamation Carl Hayden Visitors Center, Page, AZ
	Bureau of Reclamation, Denver Federal Center-Building 67, Denver, CO
	National Park Service, Presidio Golden Gate Park, San Francisco, CA
	US Fish and Wildlife Service, National Education and Training Center, Shepherdstown, WV
Labor	Frances Perkins Headquarters, Washington, DC
NASA	Marshall Space Flight Center, Project Engineering Facility Building 4203, Huntsville, AL
State	National Foreign Affairs Training Center, Arlington, VA
Transportation	Nassif Headquarters Building, Washington, DC
Treasury	Headquarters Building, Washington, DC
	Annex Building, Washington, DC
	Philadelphia Mint, Philadelphia, PA
Postal Service	Processing and Distribution Center, Fort Lauderdale, FL
	Processing and Distribution Center, Portland, OR
	Processing and Distribution Center, Saint Paul, MN
VA	Medical Center, Charleston, SC

E. Funding for Energy Efficiency in Buildings and Facilities

During FY 1996, Federal agencies had three primary options for financing energy efficiency, water conservation, and renewable energy projects in buildings and facilities: direct appropriated funding, energy savings performance (ESP) contracts, and utility-sponsored demand side management (DSM) incentives. The latter two options utilize non-Government sources of funding and can be used to supplement Government funding. Each of these three sources can be combined with another. Formerly, the DOE's Federal Energy Efficiency Fund grant program was a fourth option available to agencies for funding projects, however, there were no appropriations for the Fund in FY 1996.

To the extent that agencies have been able to provide complete reporting, funding from the three sources totaled approximately $193.6 million in FY 1996.

Direct Appropriations

The National Energy Conservation Policy Act requires each agency, in support of the President's annual budget request to Congress, to specifically set forth and identify funds requested for energy conservation measures. Table 3-A presents agency funding (in nominal dollars) reported from FY 1985 through FY 1996 for energy conservation retrofits and capital equipment. Table 3-B presents the same information in constant 1996 dollars. In constant dollars, funding for energy conservation declined from $361.6 million in FY 1985 to a low of $63.8 million in FY 1989. Reports from Federal agencies indicated that $179.2 million was spent on retrofit expenditures in FY 1996, compared with $293.9 million in FY 1995. In some cases, the data provided by the agencies include funding from operation and maintenance accounts that was specifically identified as contributing to energy efficiency. Figure 3 illustrates agency spending trends for the five largest energy-consuming agencies and the remaining group of Federal agencies.

The Defense Department funded $112.5 million in expenditures for energy efficiency projects in FY 1996. During the fiscal year the DOD finalized its plans and began work on the $1.1 billion renovation of the Pentagon. Much of this investment will be energy-related including a new energy-efficient heating and refrigeration plant, direct digital control systems for heating, ventilation and air-conditioning (HVAC) units, variable air volume boxes with variable frequency drives on HVAC units, a high voltage supervisory control and data system and efficient transformers, motors, light fixtures, and lighting controls.

No direct funding was appropriated for the Department of Energy in FY 1996 for retrofit projects in buildings and metered process facilities.

The General Services Administration spent $7.4 million in FY 1996 on energy efficiency projects. The annual savings anticipated from these expenditures is more than $4.2 million. GSA had planned to invest $50 million per year from 1994 through 2000 in order to meet the 20 and 30 percent reduction goals. In FY 1995, Congress rescinded $45.3 million. In FY 1996, energy project appropriations were $20 million of which approximately $13 million were reprogrammed for security measures following the Oklahoma City bombing. In FY 1997, only $20 million was appropriated for energy projects.

Table 3-A
Agency Expenditures for Energy Conservation Retrofits and Capital Equipment, FY 1985 through FY 1996 (Thousands of Nominal Dollars)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Projected 1997
DOC	0	0	0	0	0	0	0	872	0	51	0	0	0
DOD	**136,100**	**120,000**	**5,550**	**5,280**	**1,500**	**1,020**	**10,000**	**49,669**	**14,444**	**109,000**	**189,600**	**112,487**	**50,000**
DOE	**14,800**	**14,500**	**16,500**	**18,900**	**19,400**	**19,500**	**20,400**	**20,650**	**20,950**	**24,850**	**30,200**	**0**	**0**
DOI	3,198	5,535	0	0	4,338	0	1,272	9,800	4,859	1,662	779	891	845
DOJ	0	0	0	195	484	6,100	26,400	0	N/A	1,284	994	1,559	2,000
DOL	238	31	106	142	584	17	35	16	0	0	N/A	366	500
DOT	13,650	15,000	12,104	12,700	2,908	0	460	143	593	5,970	3,793	2,585	2,195
EPA	0	0	0	0	0	0	0	0	500	0	1,720	1,600	1,600
GSA	**6,700**	**6,100**	**2,900**	**9,400**	**4,868**	**11,125**	**30,123**	**37,000**	**30,000**	**37,000**	**7,242**	**7,400**	**20,000**
HHS	0	0	0	427	427	427	427	0	1,813	1,915	1,271	2,676	2,818
HUD	0	0	0	0	0	0	0	0	43	30	43	0	2,418
NASA	11,800	12,100	1,700	1,400	4,499	2,943	7,556	7,086	25,072	24,658	20,666	30,266	30,099
PCC	1,274	73	1,174	600	378	361	807	249	500	608	14	23	75
RRB	0	0	0	0	0	0	0	0	16	13	33	0	0
STATE	0	0	0	0	0	0	0	0	0	67	0	0	0
TRSY	0	0	2,977	2,393	2,823	1,134	836	0	1,344	4,826	2,810	170	5,272
TVA	0	0	0	0	0	0	0	0	475	844	4,277	522	601
USDA	2,500	0	0	500	500	1,547	1,752	7,300	7,045	7,277	2,894	5,983	4,324
USPS	**55,300**	**9,300**	**5,100**	**3,800**	**4,000**	**4,000**	**4,000**	**2,293**	**1,116**	**1,123**	**10,050**	**9,000**	**18,000**
VA	**13,000**	**11,500**	**9,500**	**9,860**	**5,500**	**11,200**	**9,970**	**10,000**	**12,100**	**9,050**	**11,960**	**3,700**	**3,700**
Total	258,560	194,139	57,611	65,597	52,209	59,374	114,038	145,078	120,870	230,228	288,346	179,228	144,447

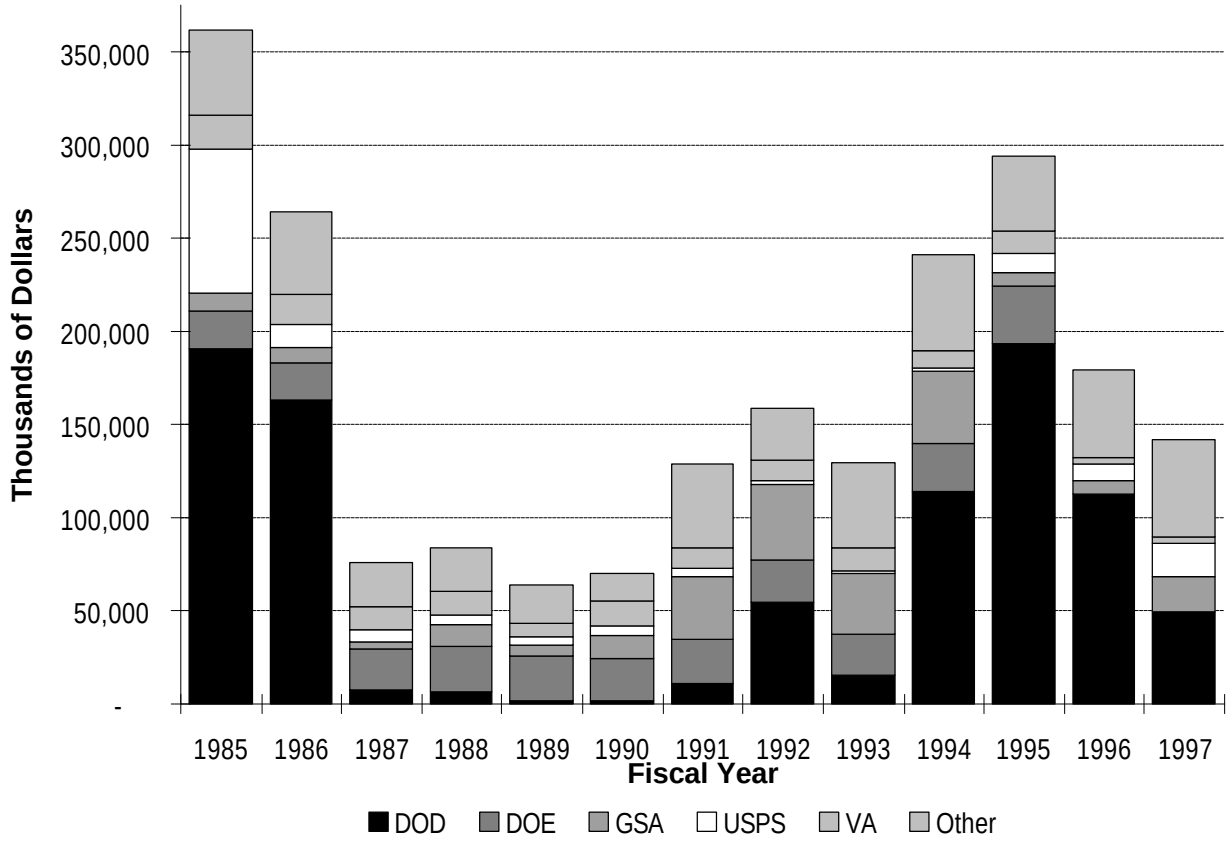
Table 3-B
Agency Expenditures for Energy Conservation Retrofits and Capital Equipment, FY 1985 through FY 1996 (Thousands of Constant 1996 Dollars)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Projected 1997
DOC	0	0	0	0	0	0	0	956	0	53	0	0	0
DOD	**190,350**	**163,265**	**7,322**	**6,726**	**1,834**	**1,196**	**11,274**	**54,462**	**15,448**	**114,017**	**193,272**	**112,487**	**49,020**
DOE	**20,699**	**19,728**	**21,768**	**24,076**	**23,716**	**22,860**	**22,999**	**22,643**	**22,406**	**25,994**	**30,785**	**0**	**0**
DOI	4,473	7,531	0	0	5,303	0	1,434	10,746	5,197	1,738	794	891	828
DOJ	0	0	0	248	592	7,151	29,763	0	0	1,343	1,013	1,559	1,961
DOL	333	42	140	181	714	20	39	18	0	0	0	366	490
DOT	19,091	20,408	15,968	16,178	3,555	0	519	157	634	6,245	3,866	2,585	2,152
EPA	0	0	0	0	0	0	0	0	535	0	1,753	1,600	1,569
GSA	**9,371**	**8,299**	**3,826**	**11,975**	**5,951**	**13,042**	**33,961**	**40,570**	**32,086**	**38,703**	**7,382**	**7,400**	**19,608**
HHS	0	0	0	544	522	501	481	0	1,939	2,003	1,296	2,676	2,763
HUD	0	0	0	0	0	0	0	0	46	31	44	0	2,371
NASA	16,503	16,463	2,243	1,783	5,500	3,450	8,519	7,770	26,815	25,793	21,066	30,266	29,509
PCC	1,782	99	1,549	764	462	423	910	273	535	636	14	23	74
RRB	0	0	0	0	0	0	0	0	18	14	34	0	0
STATE	0	0	0	0	0	0	0	0	0	70	0	0	0
TRSY	0	0	3,927	3,048	3,451	1,329	943	0	1,437	5,048	2,864	170	5,169
TVA	0	0	0	0	0	0	0	0	508	883	4,360	522	589
USDA	3,497	0	0	637	611	1,814	1,975	8,004	7,535	7,612	2,950	5,983	4,239
USPS	**77,343**	**12,653**	**6,728**	**4,841**	**4,890**	**4,689**	**4,510**	**2,514**	**1,194**	**1,175**	**10,245**	**9,000**	**17,647**
VA	**18,182**	**15,646**	**12,533**	**12,561**	**6,724**	**13,130**	**11,240**	**10,965**	**12,941**	**9,467**	**12,192**	**3,700**	**3,627**
Total	361,622	264,135	76,004	83,563	63,825	69,606	128,566	159,077	129,273	240,824	293,931	179,228	141,615

Notes: **Bold** indicates top five energy users in buildings and facilities (DOD, DOE, VA, USPS, GSA). In past years, DOE also included funds for energy surveys. Does not include energy savings performance contracts and utility demand side management incentives.

Source: Federal Agency Annual Energy Management Data Reports

FIGURE 3
ENERGY CONSERVATION RETROFIT EXPENDITURES
(In Constant 1996 Dollars)



Source: Federal Agency Annual Energy Management Data Reports

Federal Energy Efficiency Fund

The Federal Energy Efficiency Fund (Fund) was established by section 152 of EPACT, which amended section 546 of NECPA, to provide grants to agencies to assist them in meeting the mandated energy efficiency and water conservation requirements. The legislation anticipated that these funds would complement other funding sources, such as agency appropriations, utility demand side management investments, and energy savings performance contracts.

The limited grant spending authority available in FY 1994 and FY 1995 was applied to those proposals which were most competitive, considering the five factors listed below.

1. The cost-effectiveness of the project (saving-to-investment ratio).
2. The net dollar cost savings to the Federal Government.
3. The amount of energy savings to the Federal Government.
4. The amount of funding committed by the agency requesting financial assistance.

5. The amount of funding leveraged from non-Federal sources.

In a few cases, proposals were rejected due to minimal cost-effectiveness. In many cases, agencies were advised that there was insufficient spending authority available to provide funding for their otherwise worthy proposals. Inquiries during FY 1996 about the Fund were referred to energy savings performance contracting as a means of funding energy efficient projects.

The total number of proposals received since inception of the Fund (FY 1994 and FY 1995 combined) was 114. The total of all requests for Fund grants was $23.6 million, leveraging $10.6 million in Federal-agency funding, and $4.1 million from non-Federal sources. The projected Federal gross savings totaled $139 million (before payback of the initial investment) and 8.1 trillion Btu over the useful lives of all projects.

Fund grants were provided for a total of 37 projects during FY 1994 and FY 1995, with an estimated energy and water savings of $54 million (including payback), 5.8 trillion Btu, and 738 million cubic feet of water over the useful lives of the projects. The total Fund investment to realize these savings was $7.9 million, which leveraged $3.6 million in Federal-agency funding, and $0.9 million in non-Federal funding. The projects encompass 14 states, the District of Columbia, and the Caribbean. A summary of the funded projects is shown on the next page.

EPACT, 42 U.S.C. § 8258, requires energy and cost savings to be reported annually after completion of construction, for each project funded under the Federal Energy Efficiency Fund. Each Federal agency receiving grant funding was notified to submit a reporting plan to DOE which details the method of identifying the savings to be achieved for each installed energy conservation measure. Plan guidelines and energy reporting formats were provided to each agency in January, 1996. Energy reporting plans for 15 projects were received during FY 1995, and plans for the remaining 22 projects were received during FY 1996. The FY 1996 annual energy reports were received for each of the 37 funded projects, showing energy savings or projected construction completion to begin recording energy savings.

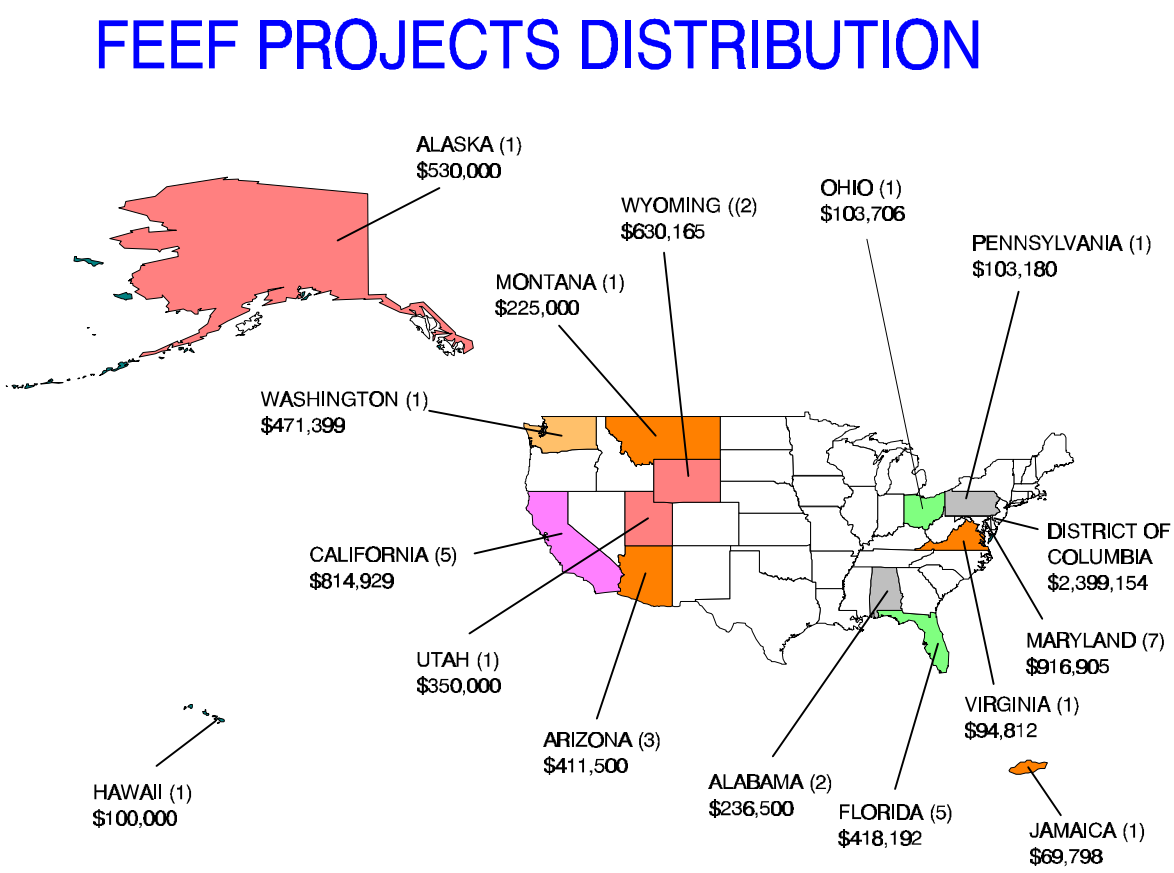
Fourteen projects are complete and operational, realizing annual energy and cost savings which equal or exceed the values projected in the original proposals for Fund grants; the projected gross energy savings over the useful lives of these projects is 163.4 billion Btu and $6.44 million, before payback of the initial investment. Thirteen energy efficient lighting projects, two water projects, and one each HVAC, chiller, natural gas conversion, and used oil processing projects are under construction for completion by the end of FY 1998. These projects have been integrated into other non-Fund building upgrades funded by the respective agencies, resulting in longer time periods required for completion. In some cases, mission requirements have also limited building access. A hybrid wind and photovoltaic renewable energy project at the Channel Islands National Park was completed for Earth Day, 1997.

Three Fund projects will put in place base-wide energy savings performance contracts for the U.S. Army at Fort Huachuca, AZ, the U.S. Coast Guard in Honolulu, HI, and the National Park Service-Presidio in San Francisco, CA. The U.S. Coast Guard project will install renewable energy solar hot water systems in housing units. The estimated gross energy savings over the useful lives of these combined projects, before payback of the initital investment, is 5.3 trillion Btu and $15.8 million.

Federal Energy Efficiency Fund Projects - FY 1996 Status

Agency	State	Project Description	Funds Awarded	Installation Status (Percent Complete)
DOC - NOAA	WA	NW Fish Science Center - Fish Culture System	$471,399	95%
DOD - US Army	AZ	Solar and Base-wide Upgrades	$310,000	80%
DOI - National Park Service	UT	Dangling Rope Marina - PV System	$350,000	100%
DOI - National Park Service	DC	White House - Transformer & NPS Detailee	$74,000	100%
DOI - National Park Service	WY	Yellowstone NP - Lighting, Heat, & Insulation	$455,665	95%
DOI - National Park Service	WY	Yellowstone NP - Phase 2 Lighting, Heat, & Insulation	$174,500	85%
DOI - National Park Service	CA	Channel Island Santa Rosa Island - Wind & PV System	$272,394	90%
DOI - National Park Service	CA	Yosemite National Park - Lighting Retrofit	$73,621	60%
DOI - National Park Service	CA	Golden Gate NRA, Presidio - Lighting Retrofit	$175,000	50%
DOL - Job Corps Center	MT	Electric to Natural Gas Conversion	$225,000	33%
DOT - FAA	OH	Lighting Retrofit	$103,706	0%
DOT - Coast Guard	AK	Used Oil Processing Facility	$530,000	95%
DOT - Coast Guard	MD	USCG Yard, Lighting Retrofit	$80,671	100%
DOT - Coast Guard	HI	Housing Area - Solar Water Heating	$100,000	50%
Treasury - US Mint	PA	Lighting Retrofit	$103,180	100%
Exec. Residence Agency	DC	White House - Lighting Retrofit & Refrigerator	$50,477	100%
HHS - NIH/National Cancer Inst.	MD	Chiller Installation	$283,463	0%
HHS - NIH/National Cancer Inst.	MD	Occupancy Sensor Installation	$129,090	4%
NASA - Dryden	CA	Edwards AFB Building #4800 Lighting Retrofit	$265,414	50%
NASA - Goddard	MD	Building's #17, 21, 22, & 23 Lighting Retrofit	$286,715	20%
NASA - Goddard	VA	E-Building Complex Lighting Retrofit	$94,812	15%
NASA - Kennedy	FL	Building M7-505 Lighting Retrofit	$144,500	100%
NASA - Kennedy	FL	Building M6-336 Lighting & HVAC Retrofits	$41,800	100%
NASA - Kennedy	FL	Buildings M6-339 & M7-581 Lighting Retrofit	$36,942	100%
NASA - Kennedy	FL	Hanger L, Building 1732 Lighting & HVAC Mods	$88,900	100%
NASA - Kennedy	FL	Launch Complex 39 Lighting Retrofit	$106,050	50%
NASA - Marshall	AL	Building 4610 Lighting Modifications	$120,000	65%
NASA - Marshall	AL	Building 4250 Water Conservation	$116,500	65%
National Gallery of Art	DC	HVAC Automation System	$2,000,000	35%
Smithsonian Institution	MD	Support Center - Phases 3, 4, & 5 Lighting	$100,000	100%
Agency for Int'l Development	Jamaica	Executive Office Building - Lighting & Windows	$69,798	100%
USDA - Agric. Research Service	MD	Building 011A - Fluorescent Lamp Retrofit	$3,640	65%
USDA - Agric. Research Service	MD	Building 011A - Lighting Occupancy Sensors	$33,326	65%
USDA - Forest Service	AZ	Apache-Sitgreaves NF Lighting Retrofit	$35,000	100%
USDA - Forest Service	AZ	Kaibab NF - Replace Telephone Switch	$66,500	100%
USDA - Forest Service	CA	Shasta-Trinity NF - NCSC Lighting Retrofit	$28,500	95%
US Soldiers & Airmen's Home	DC	Lighting Retrofit	$274,677	100%

Federal Energy Efficiency Fund Projects Distribution



Information provided for the following systems is representative of the projects funded:

DOI/National Park Service, Yellowstone National Park, WY
Twenty-six buildings, a liquid petroleum (LP) tank farm, and an electric generating facility are included in this project, which was funded under two Fund grants as Phase I and Phase II. Fluorescent lamps and magnetic ballasts will be replaced with energy efficient fluorescent lamps and electronic ballasts; incandescent lamps will be replaced with compact fluorescent lamps; diesel generators will be replaced with LPG generators; a leaking LP distribution system will be replaced with a new distribution system, gas meters and isolation valves will be installed, and underground storage tanks will be replaced; fuel oil and unit heaters will be replaced with electronic ignition power ventilated heaters; steam radiators will be replaced with finned radiators; and energy efficient boilers, hydronic heaters, HVAC ducting and controls, setback thermostats, metal halide lamps, storm windows, building insulation, and an energy efficient refrigerator will be installed.

STATUS: Phase I is 95 percent complete, and Phase II is 85 percent complete. Energy efficient lighting upgrades in four buildings range to 90 percent complete; replacement of steam radiators in one building is 50 percent complete; building insulation, HVAC upgrades, and hydronic heaters are 90 percent complete in one building; and the LP tank farm modifications are 70 percent complete. When all energy efficient improvements have been completed, the projected gross energy

savings over the useful lives of all projects, before payback of the initial investment, will be 154.3 billion Btu and $1,794,413.

Smithsonian Institution, Museum Support Center, Suitland, MD
The Museum Support Center is used for artifact storage, where millions of items from the Nation's collection are preserved. The facility is also home to the Conservation Analytical Laboratory, where research is performed to determine the best methods of artifact preservation. Energy efficiency improvements consisted of replacing fluorescent lamps and magnetic ballasts with energy efficient fluorescent lamps and electronic ballasts. Incandescent exit signs were also replaced with energy efficient light emitting diode (LED) exit signs.

STATUS: Installation is 100 percent complete. The project qualified for a $93,500 rebate from the local utility company. An energy savings of 115,320 kilowatt hours and $9,228 was realized during the FY 1996 partial year of operation. Future annual savings of 194,300 kilowatt hours and $15,550 are projected.

DOI/National Park Service, Channel Islands National Park, Santa Rosa Island, CA
This hybrid renewable energy project provides for reducing diesel consumption from generator usage by installing two 10-kilowatt wind powered electric generators, a 12-kilowatt photovoltaic solar array, controls to operate the system, and a battery bank for energy storage at night and during inclement weather.

STATUS: Installation is 90 percent complete. All system components are in place, with the exception of the windmills which will be installed in March, 1997, followed by system checkout for operation in April, 1997. Annual energy savings are projected to be 113.7 million Btu and $20,750.

DOI/National Park Service, Presidio, San Francisco, CA
The Presidio complex encompasses a complex of over 500 buildings. This Fund grant will put in place a facility-wide energy savings performance contract based upon a representative sample of ten buildings for contractor qualification. The initial project will replace fluorescent lamps and magnetic ballasts with energy efficient fluorescent lamps and electronic ballasts, replace incandescent lamps with compact fluorescent lamps, install occupancy sensors in offices and restrooms, install energy efficient exit signs, and upgrade the building envelopes. Additional energy savings opportunities are expected to be identified as the project proceeds through additional groups of buildings.

STATUS: The ESP contracting effort is 50 percent complete. The energy savings from the first group of buildings, including payback, is projected to be 2.1 billion Btu and $1,460,000 over the useful life of the energy efficient improvements.

Energy Savings Performance Contracting

Section 155 of EPACT amended Title VIII of NECPA, sections 801 and 804, relating to shared energy savings contracts. Section 801, as amended, gives agencies the authority to enter into energy savings performance contracts (ESPC) and describes the methodology of contract implementation. Energy savings performance contracts are designed to reduce the cost of energy in Federal buildings without capital investment by the building owner. Typically, the terms of such a contract provide for contractor purchase, installation, and maintenance of energy conservation measures with a guarantee of annual energy cost savings in consideration for a share of such savings. Under these contracts, the contractor is expected to bear the risk of performance, make a significant initial capital investment, guarantee significant energy savings to the Government agency, and from these savings, the agency makes payment to the contractor.

Section 801 required DOE to issue appropriate rules containing: (1) procedures and methods for selecting, monitoring, and terminating energy savings performance contracts; and (2) "substitute regulations" for provisions of the Federal Acquisition Regulation (FAR) which are inconsistent with the intent of section 801 as amended and which may be revised consistent with laws governing Federal procurement.

On April 10, 1995, DOE published in the *Federal Register* (10 CFR Part 436) a final rule that sets forth the regulations for energy savings performance contracting and achieved the directive to substitute regulations for certain provisions in the FAR. On April 18, 1995, DOE published a correction that changed the effective date of the final rule from May 10 to April 10, 1995. The ESPC regulation establishes a pilot program to test for five years the concept of accelerating installation of energy conservation measures in existing Federally owned buildings through energy savings performance contracts. The Federal Acquisition Regulatory Council concurred with the final rule.

DOE released with the ESPC regulations revised versions of model solicitations. These solicitations provide uniform formats and standardized contract provisions recommended for Federal agency use in energy savings performance contracts. The model solicitations include some provisions that have been determined necessary to accommodate the unique nature of energy conservation services which often require third-party financing.

An application process for a Qualified List of Energy Service Companies was also released with the ESPC regulations. Only firms on the Qualified List may receive an ESPC award. Firms that wish to be on the Qualified List must submit an application to DOE and possess the required experience and expertise. The list is updated on a continual basis.

Inherent to implementation of the ESPC regulation is the necessity for action by senior agency officials, agency priority on employing energy savings performance contracts, development and maintenance of trained and dedicated procurement personnel, and accountability for results. FY 1996 completes the second year of the five year ESPC pilot program. To date, the award of 42 ESPCs resulted in planned contractor investment of $76 million and provide the Government with an opportunity to save $203 million in energy costs during the life of the contracts. Eleven new ESPC awards were made during FY 1996 including six by the U.S. Postal Service, one by the Department of Justice, one by the U.S. Army, and two by the State Department.

One of the eleven awards made during FY 1996 was made by DOE for a FEMP Energy Saver Performance Contract (Super ESPC). This technology-specific Super ESPC was awarded in September 1996 to Industrial Solar Technology (IST) Corporation to provide solar energy and related energy efficiency technologies. This new approach applies indefinite-delivery, indefinite-quantity contracting provisions of the Federal Acquisition Regulations to the ESPC concept, allowing any Federal facility to issue task orders under the contract. More technology-specific and regional Super ESPCs are planned for award in FY 1997.

Energy Savings Performance Contracts Awarded in FY 1996

Project Name/Location	Project Description	Contractor Investment	Government Share of Savings
USPS, Jersey City Bulk Mail Center, NJ	Lighting retrofit	TBD	$491,200 per year
USPS, Portland, OR (2 sites)	Lighting retrofit	TBD	$350,000 per year
USPS, Milwaukee, WI	Lighting retrofit	TBD	$52,200 per year
USPS, Bonneville, WA	Lighting retrofit	TBD	$500,000 per year
USPS, Ft. Lauderdale, FL	Lighting retrofit	TBD	$89,500 per year
Dept. of Justice, Federal Bureau of Prisons, Phoenix, AZ	hot water heated by renewable energy (solar parabolic trough collectors)	TBD	$90,000 per year, $1,800,000 total
DOD, U.S. Army, Walter Reed Army Medical Center, DC	Chiller replacements and comprehensive energy improvements, maintenance	$2,355,000	$210,000 per year, $3,290,000 total
State Department, Beltsville Information Center, MD	Lighting retrofits, occupancy sensors, variable speed drives, and HVAC enhancements	$27,100 (plus $32,700 rebate)	TBD
State Department, Main State Building, DC	Lighting retrofit	TBD	TBD
DOE, Technology-Specific Super ESPC, Nationwide	Parabolic trough solar thermal systems/related energy efficiency technologies	$30,000,000 (potential)	TBD

Agencies have reported that ESPC is a difficult procedure, which must be executed under Federal Acquisition Regulations (FAR) that are procedurally complex, extremely time-consuming, and therefore burdensome for small and mid-sized energy service companies typically interested in ESPC business. In addition, many procurement officials are unfamiliar with ESPC contract conditions under the FAR. Because ESPC is a relatively new option, there are many concerns as to what is appropriate under FAR and how to evaluate and award contracts.

Demand Side Management (DSM) Program Participation

Although the availability of utility-sponsored demand side management programs is waning, Federal agency reports identified the receipt of at least $12 million in DSM rebates in FY 1996. DSM activities reported by the agencies occurred at installations widely distributed across the country. This decentralization of DSM participation makes it difficult for agencies to track all DSM activities undertaken by all respective sub-agencies, bureaus, and field offices. Total DSM benefits received by the Federal Government as a whole for FY 1996 are therefore assumed to be greater than reported.

Under DSM programs, utilities offer rebates to the customer which partially fund and help to promote the installation of new, more efficient equipment, such as lighting systems, insulation, cooling equipment, and high efficiency motors. The customer, in this case the Federal Government, is then required to finance the remainder of the equipment cost. DSM programs provide leverage for the user's investment dollars and at the same time help the utility to avoid the cost of building new power plants. EPACT and the Executive Order 12902 place heavy emphasis on DSM as a means for Federal Agencies to achieve energy conservation.

The following agencies reported participation in demand side management programs in FY 1996:

- Department of Agriculture
- Department of Defense
- Department of the Interior
- Department of State
- Department of Transportation
- Department of the Treasury
- General Services Administration
- Health and Human Services
- National Aeronautics and Space Administration
- United States Postal Service

Savings anticipated from DSM-partnered energy efficient retrofits total $6.5 million for all Federal agencies in FY 1996. GSA received rebates of approximately $1.1 million for energy conservation projects in 1996 with anticipated savings of $1.4 million. Rebates are typically offered within a geographic area, and rebates received by GSA are generally returned to the regions for additional energy project funding.

F. Life-Cycle Costing (LCC)

Section 544 of NECPA, as amended in 1988, requires DOE to establish practical and effective methods for estimating and comparing the life-cycle costs for Federal buildings using the sum of all capital and operating costs for energy systems of new buildings involved over the expected life of such system or during a period of 25 years, whichever is shorter, and using average fuel costs and a discount rate determined by the Secretary. In addition, section 544 requires that procedures be developed in applying and implementing the methods that are established. EPACT further amends NECPA to require, after January 1, 1994, agencies which lease buildings to fully consider the efficiency of all potential building space at the time of renewing or entering into a new lease.

On November 20, 1990, DOE issued a Notice of Final Rulemaking to amend Title 10 of the Code of Federal Regulations, Part 436, which sets forth guidelines applicable to Federal agency in-house energy management programs. The principal regulatory changes involved amending the life-cycle cost methodology and procedures to provide for an annually determined market-based discount rate and for a more effective system to revise annually the energy cost escalation rates that Federal agencies are required to assume. In developing the final amendments, the Department of Energy actively consulted with the Office of Management and Budget, the Department of Defense, and the General Services Administration.

In October 1996, the 1996 edition of the energy price indices and discount factors for life-cycle cost analysis, developed with the technical assistance of the National Institute of Standards and Technology, was published and distributed to Federal energy managers. In February 1996, the energy price indices and discount factors were updated to reflect the latest projections from the Energy Information Administration's *Annual Energy Outlook 1996*, published in January 1996.

G. Procurement Policy

The United States Government is the single largest purchaser of energy-related products and the largest user of energy in the U.S. Each year, the Federal Government purchases an estimated $10 to $20 billion in energy-related products. There is enormous potential for energy and dollar savings through procurement policies emphasizing energy efficiency. Such policies will not only reduce energy costs in the Federal budget, but will expand the market for efficient products, create a strong "market pull" for new technologies, and set a clear example for other government and corporate purchasers. Additionally, energy savings can translate to substantial pollution prevention.

Section 161 of EPACT directs the General Services Administration, the Department of Defense, and the Defense Logistics Agency (DLA) to undertake a program to include energy efficiency products in their procurement and supply functions. The Office of Federal Procurement Policy (OFPP) within the Office of Management and Budget (OMB) develops guidance for all senior agency procurement executives to encourage the procurement and acquisition of energy efficient products.

Executive Order 12902, "Energy Efficiency and Water Conservation at Federal Facilities," both reinforces and broadens the section 161 mandate. Specifically, section 507 of the Executive Order directs all Federal agencies to buy "best practice" products, whenever practicable and

whenever they meet the agency's specific performance requirements and are cost-effective. Best practice products are those which are in the upper 25 percent of energy efficiency for all similar products, or products that are at least 10 percent more efficient than the minimum level that meets Federal standards.

On September 12, 1995, the heads of 22 Government agencies, representing close to 95 percent of the total Federal buying power, signed the Energy Efficiency and Resource Conservation Challenge (commonly known as the "Procurement Challenge") committing themselves to purchasing energy and water saving products that will reduce their operating costs. The Procurement Challenge, initiated by DOE/FEMP and co-sponsored by the Council on Environmental Quality and OMB/OFPP, assists participants in meeting the ambitious energy and water conservation goals of EPACT and Executive Order 12902. As part of the Challenge, agencies committed to developing individual implementation plans. The plans prepared by GSA and Defense Logistics Agency in FY 1996 are serving as models for the other agencies.

Substantial strides continue to be made toward fulfilling the Procurement Challenge's goals of saving taxpayer dollars, reducing pollution, and "pulling" the market towards more energy-efficient products through increasing availability while decreasing costs.

In FY 1996, DOE/FEMP produced and distributed *Buying Energy Efficient* Products, a one-stop shopping guide, to help Federal purchasers identify products which meet the energy efficiency requirements of Executive Order 12902. The guide, which is also available on FEMP's Internet Page, www.eren.doe.gov/femp, currently includes fourteen product recommendations and will ultimately contain recommendations for 60 products. Categories covered range from fluorescent lighting to solar panels to commercial chillers. These recommendations will help agencies meet the goals of the Procurement Challenge by clearly defining the top 25 percent of efficiency for each product category, as well as presenting discounted life-cycle energy costs and savings under average use conditions. Workshops on Buying Energy Efficient Products were held in Washington, DC in March 1997 and another will be held in Atlanta, Georgia in September 1997. To be most effective, the FEMP product efficiency recommendations must reach Federal buyers in a form they can use, and need to be closely linked with other purchasing guidance, such as technical specifications and agency-specific policies and practices. Pursuant to this concern, FEMP has made considerable progress in partnership with the two major government supply agencies, the General Services Administration and the Defense Logistics Agency. The new GSA home appliance catalogue identifies products that meet or exceed the Federal efficiency recommendations, using the energy efficient symbol $^{E}_{E}$. Similarly, a new DLA catalogue will identify energy-efficient room air conditioners using the $^{E}_{E}$ symbol. Cooperative efforts with GSA and DLA will extend use of the $^{E}_{E}$ symbol to other products in the Federal supply system, including on-line databases for electronic commerce.

Coordination efforts with other buyer groups, utilities, and "market-pull" programs give FEMP's Procurement Challenge even greater leverage in meeting its energy saving, cost saving, and pollution prevention objectives. To help educate and inform government buyers at the State, local, and Federal levels on energy-efficient purchasing practices, the Energy Efficiency Procurement Collaborative was incorporated as a non-profit group in May 1996 with seed funding from DOE, EPA, and DOD. DOE's Federal Energy Management Program is also preparing an Energy Star Procurement Challenge Memorandum of Understanding, modeled on

the Federal Procurement Challenge and designed to improve energy efficiency at the State and local level. Its mission is to help educate and inform government buyers at the Federal, State, and local levels on energy-efficient purchasing practices, including on-line access to data bases on efficient products and coordination of efficiency criteria and model specifications among public agencies.

For products purchased from commercial sources, Federal efficiency levels are coordinated with EPA and DOE "Energy STAR" efficiency labels, and with non-governmental programs, such as the Consortium for Energy Efficiency and the Energy Efficient Procurement Collaborative.

Another innovative initiative developed by DOE Office of Defense Programs, FEMP, and the General Services Administration is the Basic Ordering Agreement (BOA) that streamlines the procurement of large, energy-efficient, CFC-free replacement chillers. Effective on November 15, 1996, the BOA allows Federal agencies to purchase chillers through the GSA Schedule by adopting a series of general specifications while permitting other important features to be individually specified. This allows customers to avoid the cumbersome bidding process previously required for chiller purchases, and helps "pull" the entire chiller market toward greater efficiency. Cumulative energy cost savings are estimated at $1.4 billion, over the 20-year life of replacement chillers to be installed in Federal facilities. Agencies will also realize an estimated $600 million in administrative cost savings and associated operation/maintenance services.

Real or perceived barriers to energy-efficient purchasing also arise at the policy level, and must be addressed by more explicit government-wide and agency-specific policies. DOE-proposed changes to the Federal Acquisition Regulations (FAR) Chapter 23 strengthen existing language on agency purchase of energy-efficient products that meet the criteria of Executive Order 12902. DOE has developed policy guidance for its own purchasing officers and program staff, including a section on energy-efficient purchasing in its own Acquisition Guide.

H. Public Education Programs

NECPA, 42 U.S.C. § 8258(b), requires the Secretary of Energy to include in this and subsequent annual reports information on public education programs carried out by Federal agencies and previously reported under the authority of section 381 of the Energy Policy and Conservation Act (EPCA), 42 U.S.C. § 6361(b).

EPCA requires the Secretary of Energy to establish and carry out public education programs to encourage energy conservation and energy efficiency and to promote vanpooling and carpooling arrangements. The Department of Transportation (DOT) has promoted ride sharing activities, while DOE has been responsible for other energy conservation education programs.

Through its Federal Highway Administration, DOT obligates Federal aid funds to assist State and local agencies in implementing programs designed to encourage the use of car pools, van pools, and buses by commuters. DOT efforts have included van pool acquisition programs, fringe and corridor parking facilities, ride-matching projects, preferential treatments for high occupancy vehicles, and transit service improvement. Since 1974, over $524 million in Federal-aid highway funds have been spent on such projects in an effort to establish self-sufficient programs across the Nation.

A series of reports based on joint research on Travel Demand Management (TDM) by the Federal Highway Administration and the Federal Transit Administration was published and distributed through the DOT Technology Sharing Program. "Implementing Effective Travel Demand Management Measures: Inventory of Measures and Synthesis of Experience," "Guidance Manual for Implementing Effective Employer-Based Travel Demand Management Programs," and "Overview of Travel Demand Management Measures" are three available reports. To obtain copies of these reports call 202-366-4208. A microcomputer analysis tool (with documentation) for the evaluation of TDM projects is also available through the University of Florida, Center for Microcomputers in Transportation, 512 Weil Hall, Gainesville, FL 32611-6585; telephone: 800-226-1013.

All of these reports and analysis tools are intended to provide technical assistance to individuals in the public and private sectors who are responsible for planning, implementing, operating, and/or monitoring TDM activities. They also are designed to educate these individuals on the state-of-the-practice and guide in the development of TDM programs.

The Department of Energy's public education programs encompass a wide variety of services, objectives, and audiences, covering all major areas of conservation and renewable energy. DOE has organized its technology transfer programs to meet the specific information requirements of various audiences.

DOE's Energy Efficiency and Renewable Energy Clearinghouse (EREC). EREC provides basic, technical, and financial information on various energy efficiency/renewable energy technologies and programs. The audience served by EREC includes the general public, business and industry, educational community, media, utility companies, and State and local governments. Information is provided in the form of fact sheets, DOE and National Laboratory books and brochures, bibliographies, and on-line computer-generated technology synopses. EREC's telephone number is 800-DOE-EREC and its website is located at http://www.eren.doe.gov on the Internet.

The National Energy Information Center (NEIC) responds to public and private sector questions on energy production, consumption, prices, resource availability, and projections of supply and demand. It also makes available the publications, and data tapes produced by the DOE Energy Information Administration. NEIC provides information to Federal employees and the public through an on-line bulletin board service (202) 586-2557 and at http://www.eia.doe.gov on the Internet. Electronic inquiries may be sent to infoctr@eia.doe.gov on the Internet. In 1996, NEIC staff responded to 35,809 inquiries and distributed approximately 42,971 publications.

The Office of Scientific and Technical Information (OSTI) provides coordination and direction for the management of scientific and technical information resulting from the DOE's multi-billion dollar research and development activities. As a cross-cutting Headquarters office, OSTI works in partnership with Program offices, operations offices, and contractor elements to develop

and implement information management "best business practices" to ensure that DOE maximizes the return on its $6 billion annual R&D investment. In support of national competitiveness, OSTI collects, processes, and disseminates DOE-originated research information and selected worldwide research literature on subjects of interest to domestic communities. OSTI also provides scientific and technical information services to, or on behalf of, DOE elements in support of Departmental mandates, missions, and objectives. OSTI serves the public directly or indirectly through agreements with the National Technical Information Service, Government Printing Office, depository libraries, and commercial vendors. In 1996 OSTI continued maintaining the Internet-based DOE Home Page, which provides electronic access to individuals seeking information about DOE and serves as the gateway to more specific information on DOE sites and facilities. The number of customer accesses to the DOE Home Page at http://www.doe.gov increased by 200 percent from FY 1995 to FY 1996.

OSTI manages a comprehensive collection of approximately one million scientific and technical information documents, representing 50 years of energy-related activities, and maintains the Energy Science and Technology Database (EDB), which has over 5.5 million summaries of DOE and worldwide information. The database is made available to the public on-line and on CD-ROM through commercial vendors. The majority of its users are industry, Federal and State officials, contractors, libraries, research institutions, and the public. In FY 1996, OSTI added 175,000 research summaries to the database and provided 20,000 full-text documents for public availability to the National Technical Information Service and the Government Printing Office Depository Library Program. FY 1996 initiatives included a strategic effort to process and disseminate information in an increasingly decentralized environment. As the first step towards a "virtual library," the effort will significantly improve DOE and public access to bibliographic and full-text information without major additional investment. In addition to the core program activities, OSTI's other services include printing and publishing for DOE offices; providing information management advice and consultation to the Departmental community; managing and disseminating DOE and Nuclear Regulatory Commission scientific and technical software; and representing the United States in multilateral and bilateral international information exchange agreements.

The Technical Information Program, operated by the National Renewable Energy Laboratory, provides information on energy efficiency and renewable energy to decision-makers at the Federal, State, and local levels as well as professionals in the buildings, industrial, utilities, and transportation sectors. TIP develops and produces communications products in support of EERE goals and technologies, including brochures, fact sheets, resource directories, videos, exhibits, and compilations of photos and documents.

The DOE public information mechanisms include several direct service programs designed to provide technical assistance to specific target groups. Some of these include:

- The State Energy Program, a consolidated grant program which includes the former Institutional Conservation Program, provides a flexible, supportive framework to enable the States to address their own energy priorities as well as focus on national initiatives, and strengthens their capabilities to deliver energy services. This customer-driven program seeks to increase the extent to which Federal, State, and local governments work with other public and private sector entities, including schools and hospitals, to achieve widespread adoption of

available energy efficiency and renewable energy technologies, and to demonstrate the use of emerging technologies which benefit the entire economy. This also includes working with the building industry and consumers for improvements in residential energy efficiency.

- The Industrial Assessment Center Program (IAC), formerly the Energy Analysis and Diagnostic Center, provides no-charge energy, waste and productivity assessments to help small and mid-sized manufacturers identify measures and plant and office designs to maximize energy-efficiency, reduce waste and improve productivity. The analyses are performed by local teams of engineering faculty and students from 30 participating universities across the country.

The Office of Federal Energy Management Programs (FEMP) Help Desk provided Federal energy managers with specialized information on effective energy management practices, technical assistance on implementing Federal sector energy projects, financing information, energy modeling software, publications, and energy management training programs. The primary goal of this service is to assist Federal agencies in meeting the legislative requirements. The Help Desk responded to requests for information via a toll-free automated telephone service, electronic mail, and through the Internet. The Help Desk was merged into EREC in FY 1996. The telephone number is 800-363-3732.

A full list of DOE's energy education, extension, and information services is Appendix E to this report.